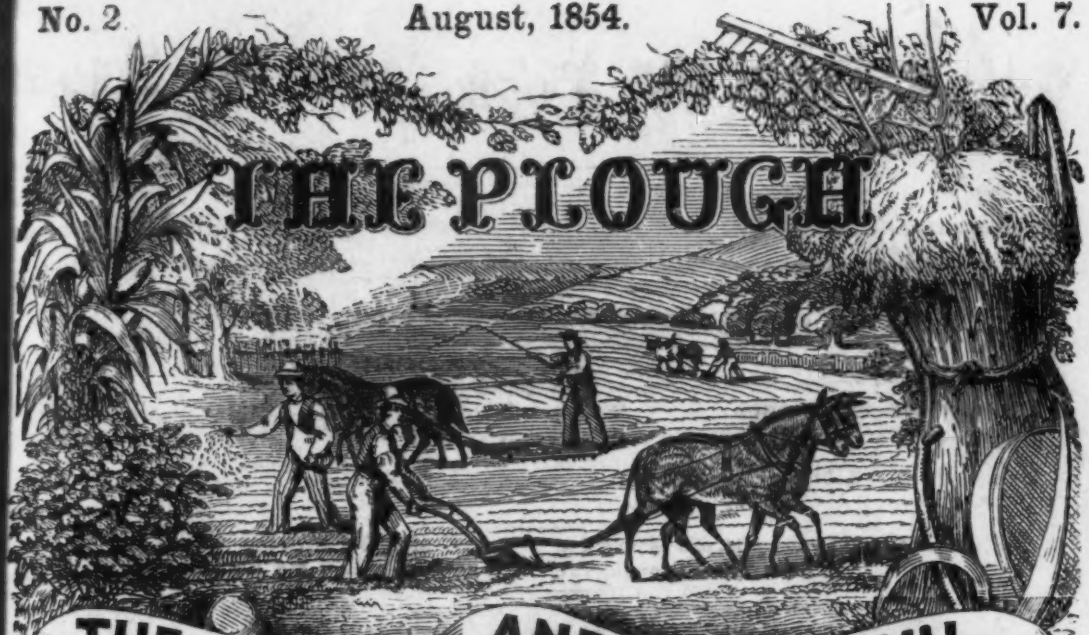
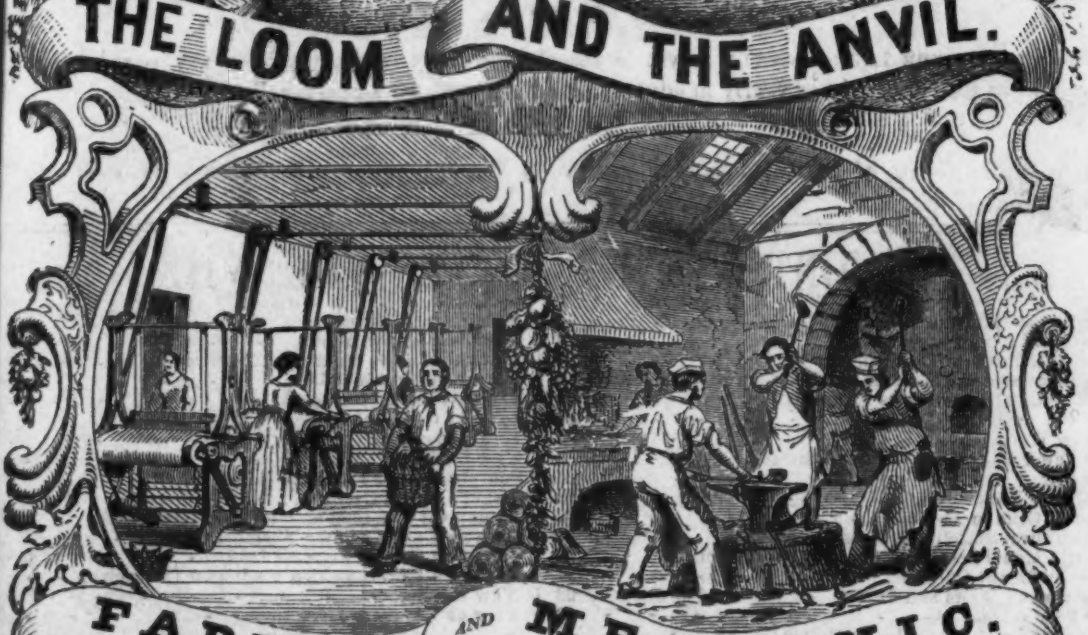
No. 2. August, 1854. Vol. 7.



THE PLOUGH



THE LOOM AND THE ANVIL.

FARMER AND MECHANIC.

DEVOTED TO SCIENTIFIC AND PRACTICAL AGRICULTURE—MANUFACTURES—MECHANICS—NEW INVENTIONS—A SOUND PROTECTIVE POLICY—FARM BUILD'NGS—COTTAGE DESIGNS—FRUIT TREES—FLOWERS—GARDENING—BEES, CATTLE, HORSES, HOGS, SHEEP, POULTRY, &c.

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IRON SCALES, &C . &C.

New-York State Agricultural Society,
State Agricultural Rooms, Albany, Feb. 20, 1853.

At the Show of the Society, held at Buffalo, in September last, a *Cattle-weighing Machine* was erected by Messrs. T. & B. Fairbanks & Co., of St. Johnsbury, Vt. The Scales of Messrs. Fairbanks were selected as most likely to give satisfaction to the exhibitors of fat cattle. The judges appointed on miscellaneous articles awarded the first premium of the Society for the machine which was erected by them,—and the judges on fat cattle, who superintended the weighing of all cattle exhibited, expressed their approbation of the great accuracy of the machine. BENJ. P. JOHNSON, Cor. Secretary.

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The Plough, the Loom, and the Anvil.

Vol. VII. AUGUST, 1854. No. 2.

THE PACIFIC RAILROAD.

COL. FREMONT'S NARRATIVE OF THE EXPLORATION OF THE CENTRAL ROUTE.

Among all improvements projected in this country, this is the most important, whether viewed in connection with its effects at either terminus of the road, or at sundry intermediate stations.

Nor can the people of this country afford to neglect works of improvement that are calculated to facilitate intercourse between its widely-separated territories. A unity that is merely nominal, or even political only, is comparatively of little value. The business and the social sympathies of the different parts must be bound together, else it is, practically, little else than a combination of different people and States, the value of which will be among the practical questions that are worthy of exact computation, and can be determined by the summing up of columns of figures representing dollars and cents.

If there is a territory anywhere within each of such a road, where the people are indifferent to the blessings secured by the Union, let that territory be marked as one through which the Pacific railroad must run at any reasonable cost. There is quite enough of a feeling of "independence" in every section of our country. There is nothing easier, nothing more natural to an American than the conviction—honest to *some extent*—that, come what will, "he can take care of himself;" and so he can, in a certain sense. He can "defend himself" when attacked, courageously and enthusiastically, but he is not omnipotent after all. He can live under great embarrassments, but he can not always remove them. He can bear to be deprived of many things deemed very important, but he can not secure the continuance of them when the fountain is dried up from which they flowed.

An innocent man, or even a guilty one, may prove a match for a posse of civil officers who come to arrest him on a criminal charge, or he may argue most eloquently and ingeniously on his trial before the court; and if convicted, he may oppose (though vainly) every attempt to inflict the penalty, and acquire more laurels of this sort than could a Genghis Kahn or the renowned Tartar of old, and he can comfort himself, for a while at least, when under lock and key, with the reflection that he has won great renown by his prowess; but he is a prisoner after all, and he can neither eat nor drink but at the will of his keepers.

He who undervalues, *not* the glory, *not* the world-wide *renown*, secured by our Union, but the domestic comfort and the sense of individual security thus guaranteed to him, knows not what he is doing.

It is under such an aspect that we regard this project as of so great importance; and we trust our readers will peruse with no little interest the

report which follows, prepared by Col. Fremont. We give it entire, with the exception of two or three paragraphs, not essentially connected with the question which is chiefly concerned, namely, the best route to the Pacific:

The country examined was, for about three fourths of the distance—from the Missouri frontier, at the mouth of the Kansas river, to the Valley of Parowan, at the foot of the Wahsatch Mountains within the rim of the Great Basin, at its south-eastern bend—along and between the thirty-eighth and thirty-ninth parallels of latitude; and the whole line divides itself naturally into three sections, which may be conveniently followed in description.

The first or eastern section consists of the great prairie slope, spreading from the base of the Sierra Blanca to the Missouri frontier, about 700 miles; the second, or middle section, comprehends the various Rocky Mountain ranges, and interlying valleys, between the termination of the great plains at the foot of the Sierra Blanca, and the Great Basin, at the Parowan Valley and Wahsatch Mountains, where the first Mormon settlement is found, about 450 miles; the third or western section comprehends the mountainous plateau lying between the Wahsatch Mountains and the Sierra Nevada, a distance of about 400 miles.

The country examined was upon a very direct line, the travelled route being about 1550 miles over an air-line distance of about 1300 miles.

The First Section.—Four separate expeditions across this section, made before the present one, and which carried me over various lines at different seasons of the year, enable me to speak of it with the confidence of intimate knowledge. It is a plain of easy inclination, sweeping directly up to the foot of the mountains, which dominate it as the highlands do the ocean. Its character is open prairie, over which summer travelling is made in every direction.

For a railway, or a winter travelling road, the route would be, in consideration of wood, coal, building-stone, water, and fertile land, about two hundred miles up the immediate valley of the Kansas, (which might be made one rich continuous corn-field,) and afterward along the immediate valley of the Upper Arkansas, of which about two hundred miles, as you approach the mountains, is continuously well adapted to settlements as well as roads. Numerous well-watered and fertile valleys—broad and level—open up among the mountains, which present themselves in detached blocks—out-liers—gradually closing in around the heads of the streams, but leaving open approaches to the central ridges. The whole of the inter-mountain region is abundant in grasses, wood, coal, and fertile soil. The Pueblos above Bent's Fort prove it to be well adapted to the grains and vegetables common to the latitude, including Indian corn, which ripens well, and to the support of healthy stock, which increases well, and takes care of itself summer and winter.

The climate is mild and the winters short, the autumn usually having its full length of bright open weather, without snow, which in winter falls rarely and passes off quickly. In this belt of country lying along the mountains, the snow falls earlier and much more thinly than in the open plains to the eastward; the storms congregate about the high mountains, and leave the valleys free. In the beginning of December we found yet no snow on the Huerfano river, and were informed by an old resident, then engaged in establishing a farm at the mouth of this stream, that snow seldom or never fell there, and that cattle were left in the range all the winter through.

This character of country continued to the foot of the dividing crest, and to this point our journey resulted in showing a very easy grade for a road, over a country unobstructed either by snow or other impediments, and having all the elements necessary to the prosperity of an agricultural population.

in fertility of soil, abundance of food for stock, wood and coal for fuel, and timber for necessary constructions.

Our examinations around the southern head-waters of the Arkansas have made us acquainted with many passes, grouped together in a small space of country, conducting by short and practicable valleys from the waters of the Arkansas, just described, to the valleys of the Del Norte and East Colorado.

The Sierra Blanca, through which these passes lie, is high and rugged, presenting a very broken appearance, but rises abruptly from the open country on either side narrowed at the points through which the passes are cut, leaving them only six or eight miles in length from valley to valley, and entirely unobstructed by outlying ranges or broken country. To the best of these passes the ascent is, along the open valley of water-courses, uniform and very gradual in ascent. Standing immediately at the mouth of the Sand Hill Pass—one of the most practicable in the Sierra Blanca, and above those usually travelled—at one of the remotest head-springs of the Huerfano river, the eye of the traveller follows down without obstruction or abrupt descent along the gradual slope of the valley to the great plains which reach the Missouri.

The straight river and the open valley form, with the plains beyond, one great slope, without a hill to break the line of sight or obstruct the course of the road. On either side of this line, hills slope easily to the river, with lines of timber and yellow autumnal grass, and the water that flows smoothly between is not interrupted in its course to the ocean. The surrounding country is wooded with pines and covered with luxuriant grasses, up to the very crags of the central summits. On the 8th of December we found this whole country free of snow, and Daguerre views taken at the time show the grass entirely uncovered in the passes.

Two tunnel-like passes pierce the mountains here, almost in juxtaposition connecting the plain country on either side by short passages five to eight miles long. The mountains which they perforate constitute the only obstruction, and are the only break in the plain or valley line of road from the frontier of Missouri to the summit hills of the Rocky Mountains, a distance of about eight hundred and fifty miles, or more than half way to the San Joaquin valley.

At this place the line entered the middle section, and continued its western course over an open valley country, admirably adapted for settlement, across the San Luis valley, and up the flat bottom-lands of the Sah-watch to the heights of the central ridge of the Rocky Mountains. Across these wooded heights—wooded and grass-covered up to and over their rounded summits—to the Coo-cha-to-ye pass, the line followed an open easy wagon way, such as is usual to a rolling country. On the high summit lands were forests of coniferous trees, and the snow in the pass was four inches deep. This was on the 14th of December. A day earlier our horses' feet would not have touched snow in the crossing.

But the winter had now set in over all the mountain regions, and the country was so constantly enveloped and hidden with clouds which rested upon it, and the air so darkened by falling snow, that exploring became difficult and dangerous, precisely where we felt most interested in making a thorough examination. We were moving in fogs and clouds through a region wholly unknown to us, and without guides; and were, therefore, obliged to content ourselves with the examination of a single line, and the ascertainment of the winter condition of the country over which it passed, which was, in fact, the main object of our expedition.

Our progress in this mountainous region was necessarily slow, and during ten days, which it occupied us to pass through about one hundred miles of the mountainous country bordering the eastern side of the Upper Colorado valley, the greatest depth of the snow was, among the pines and aspens on the ridges, about two and a half feet, and in the valleys about six inches. The atmosphere is too cold and dry for much snow, and the valleys, protected by the mountains, are comparatively free from it, and warm. We here found villages of Utah Indians in their wintering ground, in little valleys along the foot of the higher mountains, and bordering the more open country of the Colorado valley. Snow was here (December 25) only a few inches deep—the grass generally appearing above it, and there being none under the trees or on the southern hill sides.

The horses of the Utahs were living on the range, and notwithstanding that they were used in hunting, were in excellent condition. One which we had occasion to kill for food had on it about two inches of fat, being in as good order as any buffalo we had killed in November on the eastern plains. Over this valley country—about one hundred and fifty miles across—the Indians informed us that snow falls only a few inches in depth, such as we saw it at the time. The immediate valley of the Upper Colorado, for about one hundred miles in breadth, and from the 7th to the 22d of January, was entirely bare of snow, and the weather resembled that of autumn in this country.

The line here entered the body of mountains known as the Wah-satch and An-ter-ria ranges, which are practical at several places in this part of their course; but the falling snow and destitute condition of my party again interfered to impede examinations. They lie between the Colorado valley and the Great Basin, and at their western base are established the Mormon settlements of Parowan and Cedar City. They are what are called fertile valleys, offering inducements to settlement and facilities for making a road. These mountains are a great store-house of materials—timber, iron, coal—which would be of indispensable use in the construction and maintenance of the road, and are solid foundations to build up the future prosperity of the rapidly-increasing Utah State.

Salt is abundant on the eastern border mountains, as the Sierra de Sal, being named from it. In the ranges lying behind the Mormon settlements, among the mountains through which the line passes, are accumulated a great wealth of iron and coal, and extensive forests of heavy timber. These forests are the largest I am acquainted with in the Rocky Mountains, being in some places twenty miles in depth of continuous forest; the general growth lofty and large, frequently over three feet in diameter, and sometimes reaching five feet, the red spruce and yellow pine predominating. At the actual southern extremity of the Mormon settlements, consisting of the two inclosed towns of Parowan and Cedar City, near to which our line passed, a coal-mine has been opened for about eighty yards, and iron-works already established. Iron here occurs in extraordinary masses, in some parts accumulated into mountains, which comb out in crests of solid iron, thirty feet thick and a hundred yards long.

In passing through this bed of mountains, about fourteen days had been occupied—from January 24 to February 7—the deepest snow we here encountered being about up to the saddle skirts, or four feet; this occurring only in occasional drifts in the passes on northern exposures, and in the small mountain flats hemmed in by woods and hills. In the valley it was sometimes a few inches deep, and as often none at all. On our arrival at the Mormon

settlements, February 8th, we found it a few inches deep, and were there informed that the winter had been unusually long-continued and severe, the thermometer having been as low as seventeen degrees below zero, and more snow having fallen than in all the previous winters together since the establishment of this colony.

At this season their farmers had usually been occupied with their ploughs, preparing the land for grain.

At this point, the line of exploration entered the third or western section, comprehending the mountainous *plateau* between the Wah-satch mountains and the Sierra Nevada of California. Two routes here suggested themselves to me for examination—one directly across the *plateau* between the 37th and 38th parallels; the other keeping to the south of the mountains, and following for about two hundred miles down the valley of the Rio Virgen—Virgin river—thence direct to the Trejon Pass, at the head of the San Joaquin valley.

This route down the Virgin river had been examined the year before, with a view to settlement this summer by a Mormon exploring party, under the command of Major Steele, of Parowan, who (and others of the party) informed me that they found fertile valleys inhabited by Indians who cultivated corn and melons, and the rich ground in many places matted over with grape-vines. The Trejon Passes are two, one of them, from the abundance of vines at its lower end, called Caxon de las Uvas. They were of long use, and were examined by me, and their practicability ascertained in my expedition of 1848–'49; and in 1851 I again passed through them both, bringing three thousand head of cattle through one of them.

Knowing the practicability of these passes, and confiding in the report of Major Steele as to the intermediate country, I determined to take the other, (between the 37th and 38th parallels,) it recommending itself to me as being more direct toward San Francisco, and preferable, on that account, for a road, if suitable ground could be found; and also as being unknown, the Mormons informing me that various attempts had been made to explore it, and all failed for want of water. Although biased in favor of the Virgin river route, I determined to examine this one in the interest of geography, and accordingly set out for this purpose from the settlement about the 20th of February, travelling directly westward from Cedar City, (eighteen miles west of Parowan.) We found the country a high table-land, bristling with mountains, often in short isolated blocks, and sometimes accumulated into considerable ranges, with numerous open and low passes.

We are thus always in a valley, and always surrounded by mountains more or less closely, which apparently altered in shape and position as we advanced. The valleys are dry and naked, without water or wood; but the mountains are generally covered with grass and well wooded with pines; springs are very rare, and occasional small streams are at remote distances. Not a human being was encountered between the Santa Clara road, near the Mormon settlements, and the Sierra Nevada, over a distance of more than three hundred miles. The solitary character of this uninhabited region—the naked valleys without water-courses, among mountains with fertile soil and grass, and woods abundant, give it the appearance of an unfinished country.

Commencing at the 38th, we struck the Sierra Nevada on or about the 37th parallel, about the 15th of March.

On our route across we had for the greater part of the time pleasant and rather warm weather; the valley grounds and low ridges uncovered, but snow over the upper parts of the higher mountains. Between the 20th of

February and 19th of March we had several snow-storms, sometimes accompanied with hail and heavy thunder; but the snow remained on the valley grounds only a few hours after the storm was over. It forms not the least impediment at any time of the winter. I was prepared to find the Sierra here broad, rugged, and blocked up with snow, and was not disappointed in my expectation. The first range we attempted to cross carried us to an elevation of 8000 or 9000 feet, and into impassable snow, which was further increased on the 16th by a considerable fall.

There was no object in forcing a passage, and I accordingly turned at once some sixty or eighty miles to the southward, making a wide sweep to strike the point of the California mountain where the Sierra Nevada suddenly breaks off and declines into a lower country. Information obtained years before from the Indians led me to believe that the low mountains were broken into many passes, and at all events I had the certainty of an easy passage through either of Walker's passes.

When the point was reached, I found the Indian information fully verified; the mountain suddenly terminated and broke down into lower grounds barely above the level of the country, and making numerous openings into the valley of San Joaquin. I entered into the first which offered, (taking no time to search, as we were entirely out of provisions and living upon horses,) which led us by an open and almost level hollow thirteen miles long to an upland not steep enough to be called a hill, over into the valley of a small affluent to Kern river; the hollow and the valley making together a way where a wagon would not find any obstruction for forty miles.

The country around the passes in which the Sierra Nevada here terminates declines considerably below its more northern elevation. There was no snow to be seen at all on its eastern face, and none in the pass; but we were in the midst of opening spring, flowers blooming in fields on both sides of the Sierra.

Between the point of the mountains and the head of the valley at the Trejon the passes generally are free from snow throughout the year, and the descent from them to the ocean is distributed over a long slope of more than two hundred miles. The low dry country and the long slope, in contradistinction to the high country and short sudden descent and heavy snows of the passes behind the bay of San Francisco, are among the considerations which suggest themselves in favor of the route by the head of the San Joaquin.

RESULTS OF AMERICAN INDUSTRY.

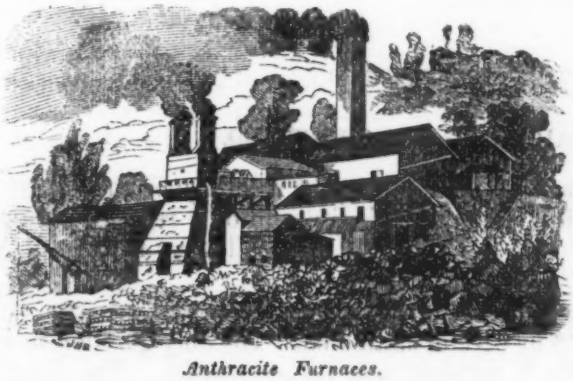
If any one wishes to see the vast good which comes, directly or indirectly, from the encouragement of the various arts and manufactures, let him visit the great State of Pennsylvania. The villages and cities, even, that have grown up under such an influence, are scattered over the length and breadth of that rich and growing commonwealth. We have presented, at some length, a view of the iron and coal of that region, and the immense wealth created by the manufacture and sale of these minerals.

The largest and richest beds of limestone also are found here. The view here given represents the lime-kilns near Spring Hill. They occur above Morristown, where the hills of the Mine Ridge, somewhat depressed, rise out of and cut off the basin. They are met alternately "in subordinate ridges and valleys of denudation." At various points along the Schuylkill, especially near Spring Hill, Conshokocken, and Port Kennedy, there are very

extensive quarries, where kilns have been erected for burning the stone. They are generally placed on the side of a hill, thereby furnishing peculiar

Lime Kilns near Spring Hill.

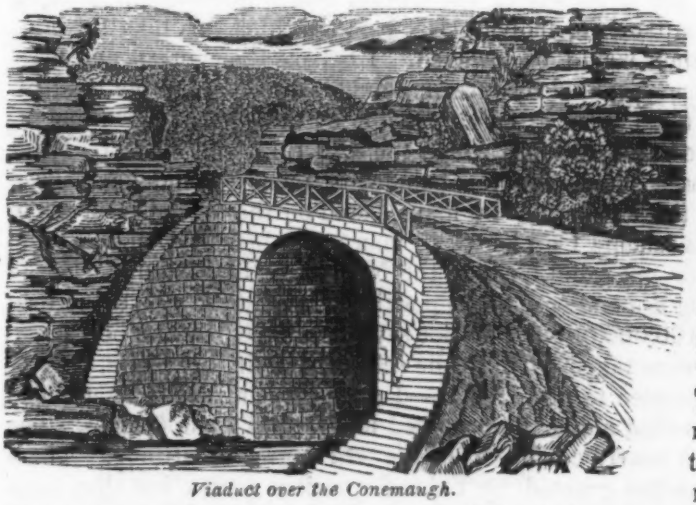
facilities for throwing in the lime at the top. The stones, as placed in the kiln, form an arch over the hearth, with sufficient space between alternate layers to permit the heat to penetrate and decompose them.



Anthracite Furnaces.

Spring Hill receives its name from a superb boiling spring. A short distance above Manayunk, is one of the most extensive anthracite furnaces in the State. It is on the east bank of the Schuylkill, and presents a spirited scene when viewed from the READING RAILROAD, especially in the evening, when the flames issuing from the chimneys illumine the whole neighborhood.

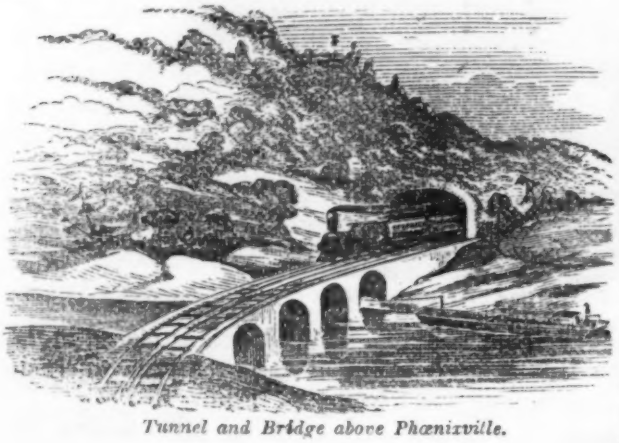
The Reading railroad abounds, along its entire length, with views full of interest. The works of the road itself are peculiarly imposing, while the natural scenery of the territory through which it passes is exceedingly various, and much of it very beautiful.



Viaduct over the Conemaugh.

We also present a view of one of the structures upon the Philadelphia and ColumbiaRailroad, namely, the Viaduct over the Conemaugh. It consists of a single arch of eighty feet, and nearly seventy-five feet above the water of the stream. The engraving also represents the nature of the rocky ridge around which the stream is forced to wind its bed. The little stream is driven nearly a

mile out of its course. The view here given is the western side of the ridge. Of this viaduct Mr. Smith says: "While it can scarcely be surpassed in the neatness and symmetrical proportions of the design, it is as durable as the eternal foundation upon which it rests."



Tunnel and Bridge above Phœnixville.

On the Reading Railroad, a short distance above Phœnixville, is a tunnel more than 2000 feet in length. It is cut through solid dark-red sandstone, and is probably one of the heaviest sections of railroading in the United States. Emerging from the tunnel, the road crosses a splendid and substantial stone arched bridge over the Schuylkill.

PACIFIC RAILROAD: MR. CHATFIELD.

THIS important subject has been discussed in the meetings of the American Geographical and Statistical Society of this city, and on a recent occasion the Society was addressed by Levi S. Chatfield. The following is an outline of his remarks:

"The history of this project is characteristic of our people and country. It was spoken of as early as 1836 by several statesmen. The only question now is one of finance and route, for it certainly will be constructed. The things to be considered are, Where shall it be? what its length and what the character of the country it goes through? I speak to-night of the Texas route, with reference to all these particulars. Colonel Benton has spoken of its being constructed and worked by the United States government free; the terminus to be in St. Louis. This is not probable. Mr. Whitney has directed public attention to the propriety of the United States government making grants of land to companies or individuals. I do not think this plan the best, because the completion would be delayed. I believe the shortest and least expensive plan is one suggested by myself, namely, to construct the road by a legal corporation, to be aided as far as possible by the general government, to be adopted by the States through which the road runs, and aided by them as far as they choose. I suppose the balance of money would be realized by assessments on the stock, and by loans based on the available means of the company. This scheme I presented to many members of Congress, who recommended me to get a bill for it in the New-York Legislature. This I succeeded in having done after some opposition. The stock was subscribed to the amount of $100,000,000. I do not say it was taken by the best possible names. Steps were taken to have the scheme put in operation. Commissioners were appointed to go to Texas—I among them, where I remained two months. I travelled along the proposed line of road for 300 miles. The general law of Texas nearly confines it to the 32d degree of latitude. There are several other charters granted by Texas for various routes, but they have not been acted on by that State, which shows that her capital is not equal to

the work. Texas has passed a law that whatever company undertakes the 33d degree road shall have 20 sections to the mile; that is, 1280 acres. I regard this as the most magnificent bonus ever offered any company. The 800 miles give 10,240,000 acres, worth $5 per acre, within the time the company is bound to dispose of it; that is, $51,000,000. Several competent judges have pronounced this country the first on the face of the globe, especially the north-eastern counties of Texas, through which one half of the road would pass. I estimate the cost at $32,000,000; good judges say only half that; but the country is a rolling country, through which the cost of grading would be considerable. West of the Trinity River the land is mostly prairie; but east of it is most productive; the staples would be wheat and cotton. I think two bales to the acre could be raised. I am satisfied Governor Stephens's Northern Route is not nearly as productive. From El Paso to Adair Bay the route through Mexico is practicable; the rest of the way to San Francisco is doubtful, but I believe it will be found practicable. But if the road ceased at Adair Bay all the purposes of commerce would be subserved. In this case, I put down the cost from El Paso at $50,000 a mile, that is, $25,000,000. This would make the whole cost only $6,000,000 over the value of the land granted. Beside, the company might take advantage of the other charters, and thus get in addition 16 sections to the mile. Connecting lines are either made or projected all the way to New-York. This is the shortest of all the proposed roads between the oceans. I believe that Matagorda would be the freight terminus. Either it or Galveston, though not very good harbors at present, could easily be made so. Texas has a full right to give away all the land she gives by those charters. Her course in this regard I consider eminently statesmanlike; she should give every acre away to open up her country to commerce. As it is, the inhabitants are so segregated that they have no motive to industry and commerce. Her cotton-lands are far superior to most of the Southern States. I think an investment in these lines would be the best that could be made."

Mr. Disturnell proposed, at a future time, to make an exhibit of the northern and central route.

THE DELAWARE, LACKAWANNA, AND WESTERN RAILROAD COMPANY.

Our first thought, suggested by reading a report of this company, is the extensive influence of a single step in internal improvements. No one is disconnected from others. On the location of the New-York and Erie Railroad, it was proposed to open the great northern coal basin of Pennsylvania. A charter was obtained and a company organized in 1850, for that portion between the basin at Scranton and the New-York and Erie Railroad at Great Bend. This was called the Leggett's-Gap Railroad. The name of this company was changed to that of the Lackawanna and Western Railroad Company, in 1851. In 1849, the charter of the Delaware and Cobb's-Gap Railroad Company was obtained, and the company was organized in 1850. In 1853, these two companies were consolidated. This line of railroad forms a part of the great line extending from Oswego, on Lake Ontario, to New-York. The several parts are as follows:

Oswego and Syracuse Railroad, - - -	35 miles.
Syracuse and Binghamton Railroad, - -	80 "
Binghampton to Scranton Coal-fields, - -	62 "
Scranton to New-York, via New-Jersey Central, -	125 "

or a total distance of 302 miles.

This company has secured some of the choicest lands in the valley. From Mr. Needham's report, it appears that the minable coal on the company's lands will EXCEED 50,000,000 TONS.

The mining lands of this company are situated in the Lackawanna Valley, south-west of Cobb's and Leggett's Gaps, and east, south, and south-west of the village of Hyde-Park; the town of Scranton being approximately in its centre. One portion of these lands lies outside or to the south-east of the natural boundary of the Lackawanna coal-field; the other and far more valuable part of the estate embraces all the south-eastern side and central tracts of the coal-basin, extending up the valley, north-east, to within a mile or so of the villages of Dunmore and Providence, and in the opposite direction, south-west, with some interruptions, two miles and a half from Scranton; its northern and north-western boundary being on the table-land north of the Lackawanna meadows. The amount of productive coal-lands thus situated, belonging to the two companies, is estimated at about 3000 acres.

Reports have been made by Mr. Needham, and by Prof. H. D. Rogers, State Geologist, in reference to these lands. The former represents the general outlines of the workable veins on that portion which is known as the "Griffin Lot," as follows:

"The first in the *descending* order is the 'A' vein, 8 feet; the second, a 3 feet vein; then 'B' 4 feet, where it has been worked; 'C' 5 feet; 'D' 8 feet, and 'E' 15 feet, making 43 feet in 6 veins, all belonging to the upper series of free-burning or steam coals. *All* these veins would be worked in Schuylkill, and can be worked here; but the smaller veins would cost more in proportion, per ton, for mining, than the larger ones. Of the entire thickness of this upper series, 21 feet may be classed with the superior coals for generating steam, possessing great heating powers, a very active combustion, with rectangular fracture, suiting a condensed stowage, for oceanic navigation; containing little earthy matter, and leaving a residuum of about 7 per cent ashes. The lower series comprises five working veins, of a very dissimilar coal. The first of this second series, the 'F' vein, varies from 6 feet to 8 feet 4 inches pure coal, devoid of slate, of a semi-conchoidal fracture, and altogether one of the most splendid coals sent to market, excelled only by a small vein of the Lehigh, 3 feet thick, known as the 'clear vein,' the heaviest and purest *known anthracite.* This vein will be mined and sent to market, for the first time, this year (1854) from this coal-field. We hope to be ready in time to mine and send to market this year about forty thousand tons of this coal.

The next in the series is the big vein of Wilkesbarre and Pittston, varying from 9 to 18 feet. This, the 'G' vein, with its usual slates, measures on the Griffin lot 18 feet 1 inch; is a good hard, firm coal; rectangular fracture, well known in your city as the Pennsylvania Coal Company's. Then comes the 'H' vein, a superior coal, very similar in hardness, fracture and quality to the 'F' vein above mentioned, and is 8 feet thick. These three veins alone will produce, of good merchantable coal, on the Griffin lot, 27 feet in thickness, equal to 34,560 tons per acre, after deducting 20 per cent for mine-waste and supports. The coal of the three above veins, 'F,' 'G,' and 'H,' are all of the hard variety of anthracites; excellent for foundry, furnace, and smithing purposes; and with blowers, would answer well for steam purposes. I forgot to mention that the coals of the upper series are excellent steam-producing coals, *without the aid of blowers.*

Next, and last in order, are the veins 'I' and 'K,' 6 and 4 feet respectively in thickness. They are worked at Dunmore, by the Pennsylvania Coal Company, but are inferior in quality to the veins of 'F,' 'G,' and 'H,' although fair merchantable coals."

VERTICAL SECTION OF THE GEOLOGICAL FORMATION

Of the Coal-lands belonging to the "*Delaware, Lackawanna, and Western Railroad Company.*" By B. NEEDHAM, Mining Engineer.

NUMBER.	STRATIFICATION.	THICKNESS.	COAL.
	Descending order.		
	Shales,	114 ft.	
A	Coal,	8	8 ft.
	Stigmaria shales.		
	Micaceous sand-stone and shales,	90	
B	Coal,	4	4
	Nodular iron-ore in stigmaria shales,	8	
C	Coal,	5	5
	Nodular iron-ore in sand-stone shales,	20	
D	Coal,	8	8
	Stigmaria shales,		
	Micaceous sand-stones,	101	
E	Coal,	15	15
	Stigmaria shale, black-band iron-ore,	6 in.	
	Micaceous sand-stones,	45	
F	Coal,	8	8
	Shales,	56	
G	Coal,	18	18
	Stigmaria shales, and	22	
	Nodular iron-ore,		
H	Coal,	8	8
	Stigmaria shales, and	20	
	Micaceous sand-stones,		
I	Coal,	6	6
	Stigmaria shales,	40	
	Micaceous sand-stones,		
K	Coal,	4	4
	Stigmaria shales,	30	
	Slates,	2	2
L	Coal,		86 ft.
	Stigmaria shales,		
	Conglomerate,	70	

Buff-colored sand-stone.

The capacity of the "Diamond-mine tract" is nearly as great, the product being estimated at 25,000,000 tons.

The following account is taken from the report of Professor Rogers:

GENERAL TOPOGRAPHICAL FEATURES.

Like the other Anthractic coal-fields of Pennsylvania, this large and rich basin of the Lackawanna and north branch of the Susquehanna is surrounded by a double belt of mountain summits; but instead of that usually entire separation of the inner and the outer ridges which is so conspicuous in the Pottsville, the Shamokin, and other coal-valleys, the intervening deep narrow valley of red shale is here only a high sloping platform or bench on the side of the exterior mountain, and the interior crest but a subordinate ridge or shoulder between this bench and the main valley.

The coal-field, or trough of the coal, containing strata, encompassed by this picturesque mountain rim, is a very elongated valley, some fifty miles in length, from Beech Grove to Carbondale, and not more than five miles wide in its broadest central portion, between Solomon's Gap and the entrance of the Susquehanna at Pittston. Its form is that of a very regular, symmetrical crescent, curving in its course as much as fifty degrees, the northern horn at Carbondale pointing nearly north twenty degrees east, while the western one at Beech Grove is directed only twenty degrees south of west. In its interior features this valley is extremely diversified, and it is full of landscapes of uncommon beauty. From Pittston to Nanticoke, or between the points where the Susquehanna enters and leaves the Basin, the northern half of the main bed of the valley is a wide, level, fertile plain, or low diluvial floor, watered by the tree-fringed river. A similar but narrower belt of low ground, underlaid in like manner with a deep deposit of drift or gravel, winds through the whole length of the upper north-eastern portion of the valley, or that occupied by the Lackawanna.

GENERAL VIEW OF THE STRATA.

Taking a comprehensive glance at the several rocky strata which surround and are embraced within the Wyoming and Lackawanna Basin, they will be found to constitute four distinct groups, differing in their positions, composition, and the value of their imbedded deposits.

1st. The first and lowest in the order of stratification is a thick series of gray sandstones, occasionally pebbly, and including beds of shale. This outcrops high on the inner slope and summit of the outer broad mountain-ridge of each border of the Basin. The formation is several hundred feet in thickness; and is the lowest or oldest of our American carboniferous strata, but in this part of the mountain-chain of the country, contains no coal nor any notable amount of iron ore. It is called the vespertine series in the nomenclature adopted by Professor Wm. B. Rogers and myself for the rocks of the Alleghanies. Some of the extreme south-eastern tracts of the Company's estate extend into this formation, where it forms the high mountain bordering the upper reach of the valley of Stafford Meadow Brook.

2d. Next in succession, overlying the previous set, and outcropping to form the bench, or sometimes valley, which follows the inner slope of the outer or main mountain all round the Coal Basin, is a mixed group of strata, red shales in the inferior portion, gray sandstones and buff-colored slates in the middle, and a peculiar hone-like, very close-grained calcareous sandstone in the upper. Such is the character of this formation in the vicinity of Scranton, and elsewhere on the borders of the Lackawanna division of the Basin, where its total average thickness does not amount to 350 feet, and where the

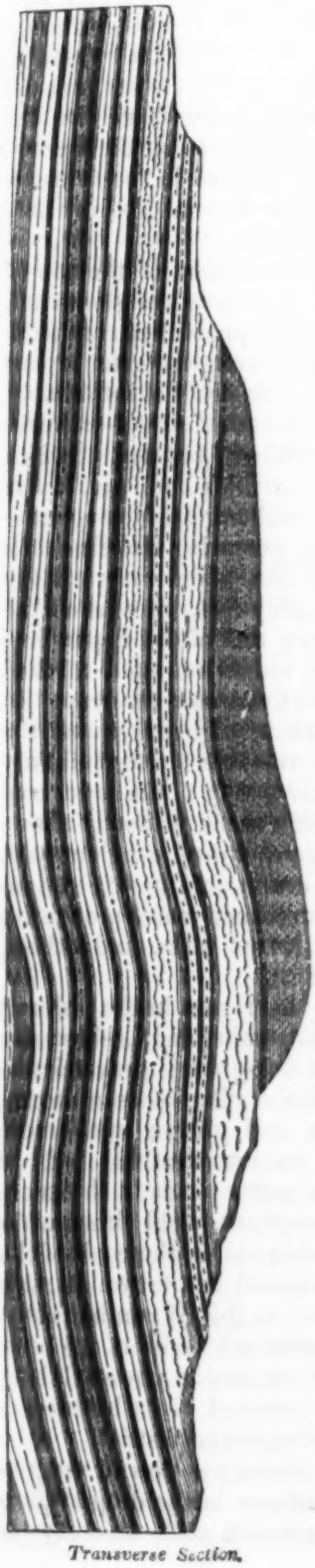
red shale of the lower member of this mass is extremely thin, and in places altogether absent. But further south-westward, especially from Solomon's Gap to Beech Grove, the red shale assumes great relative bulk, and the middle and upper divisions, as at Nanticoke, are comparatively quite reduced, the whole formation being here from two to three times as thick as where it bounds the Lackawanna valley. It is among the layers of the lower or shale group of this formation that we encounter the interesting *calcareous iron ore* of the Stafford Meadow Valley, now extensively mined there on the Lackawanna Iron and Coal Company's lands, and largely smelted in the furnaces at Scranton. The whole formation is the umbral series of mine and my brother's classification, or the middle carboniferous formation.

3d. Immediately over the fine-grained, hone-like sandstone of the top of the umbral series, rests the coarse, massive, white and gray conglomerate, which constitutes the base or supporting member of the productive coal measures, or upper carboniferous series; this is the seral conglomerate of our classification. All round the Wyoming and Lackawanna coal-field, this well-known and easily-recognized rock is composed of two sets of strata—a lower group made up in large part of extremely coarse pebbles of nut size, of white quartz and gray sandstone, compactly cemented into thick and ponderous beds—and an upper set, of less massive layers of a smaller grained conglomerate, and dark gray sandstones, the pebble seldom exceeding the size of a pea or small hazel-nut. The average thickness of the lower mass on the south-east side of the Basin is from seventy to eighty feet, whereas on the north-west side it seems nowhere to exceed forty feet; that of the upper, fine-grained rock, varies from sixty to ninety feet, but shows no such marked reduction in passing from its south-eastern to its north-western out-crop. At Scranton, on Roaring Brook, the coarser rock is about eighty feet, and the finer grained, which is here quarried, and makes a valuable, strong building-stone, is about the same thickness. A comprehensive study of the lower coal strata, and of the conglomerates interstratified among them, distinctly shows that even the main undermost, coarsest pudding-stone, or seral conglomerate, is itself properly but a member of the true coal measures, and in no sense an independent formation. There are districts in Pennsylvania where productive coal seams occur imbedded within this coarsest, lowest mass, and others, indeed, where such exist even beneath or outside of it.

4th. The last and highest of the formations of the region in the order of stratification is the coal formation proper. In the Wyoming and Lackawanna basin, this consists, as is well known, of coarse and fine-grained gray micaceous sandstones, pebbly in some of their beds; and of argillaceous sandstones, shales, slates, and fire-clays; some more siliceous and gritty; some more aluminous and smooth; and between all these are interstratified beds of anthracite of all dimensions, from a few inches to many yards in thickness. All the coal seams, with one or two very local exceptions, yield either white or gray ashes, and, as in the Pottsville and Shamokin basins, the coals of this character are overlaid by a group of beds, producing red and brownish ashes such as are not here met with, it is fair to infer that in this Wyoming valley we have the representatives of only the lower or white-ash series of the other great basins. Denuding action, which has been especially powerful here, may have swept off the once overlying and more exposed red-ash series, or these possibly may never have been formed in this northern district.

It is impossible to estimate with precision, until researches now in progress are completed, the total thickness of the coal measures in the deepest parts of the Wyoming and Lackawanna basin, nor to count with accuracy the

number of the available beds of coal in those localities. For my present purpose, that of a general sketch of the geology and vast mining resources of this valley, it will be sufficient to state here, that exact measurement has already disclosed, in the vicinity of Wilkesbarre, the widest and apparently the deepest portion of the coal-field, the existence of from 1000 to 1200 or more feet of coal-bearing strata, and the presence within these of sixteen or eighteen separate beds of coal; two or three of them being compound seams of great size, and about ten or more of the whole series being permanently of ample dimensions for profitable mining. This depth of the coal measures, and the number of the contained coal, seems to grow less, of course, from the centre of the basin towards its two margins, and also towards its two contracting extremities.



Transverse Section.

GENERAL STRUCTURE OF THE BASIN.

In general configuration, the Wyoming basin is a wide and shallow trough, somewhat deeper in the middle than at the sides, yet deepening so gradually toward the centre as to be, if we disregard the subordinate undulations of its strata, approximately flat. This prevailing levelness of its bed or floor, notwithstanding the considerable angles of dip—frequently more than thirty degrees—is at once apparent when we compare the great width of the valley—four or five miles in its middle district—within the very moderate depth of 1200 or 1500 feet, or perhaps 1800 feet, which my sections seem to assign to it, in this its most capacious portion. Laborious explorations and measurements have enabled me to bring to light, within the general basin the existence of a great number of nearly parallel lesser troughs or basins, with intervening saddles or anticlinal waves in the coal strata, and to trace these individually, and to develop the law of their direction and their effects on the local distribution of the beds of coal. These investigations have shown me that the same coal seams and other strata are repeated, within certain limits, from one wave to another, so as to maintain, despite the local steepnesses of dip, this average uniformity in the depth of the coal-field at any given cross section. This general levelness of the bottom is independently established by a comparison of the vertical thickness of the strata with the breadth of the valley.

The whole coal-valley may be likened to a flat-bottomed boat, tapering gradually from the middle towards each extremity, and as gradually

shoaling up in those directions; but the boat is not a straight one, but curves constantly, crescent-like, toward one side, and the resemblance is further deficient in the bottom not being smooth, but ridged with the waves, above spoken of.

THE COAL MEASURES.

It has been already stated that the coal-containing strata of the vicinity of Scranton appertain to the lower group of the white-ash coal measures of the anthracite basins; and it was also remarked that this group exhibits greater fluctuations in the dimensions and quality of the coal-beds than any other subdivision of the whole coal formation. These fluctuations, it is appropriate to add, belong equally, or in a greater degree, to the rocks which fill the intervals between the coal-beds. It would seem as if the physical conditions under which these earliest coal strata were deposited were more inconstant than those which belonged to the later stages of the formation. The spaces over which the nearly perfect state of repose of the surface prevailed, necessary to the accumulation by slow growth of the vegetable peaty mass producing each seam of coal, were evidently of a narrower geographical extent than afterward; and the currents and disturbances of the earth's crust, which buried these successive peat swamps under the clayey, sandy, and even coarse, gravelly strata that rest upon or between them, were obviously much more violent than in the middle and final ages of the great coal period.

Nowhere, perhaps, in the anthracite country, are the proofs of this instability of the surface during the first stages of the coal formation more conspicuously manifested than in the Wyoming and Lackawanna basin. Here we find, in certain neighborhoods, in the same few hundred feet thickness of these lower coal strata, as many as ten or twelve separate beds of coal, while in other localities there exist not more than half, or even a third of this number; and what is more material, the very same individual bed which in one quarter possesses an ample, or indeed superabundant thickness, is in another but a dwindled seam, too thin or too impure for profitable mining. Without attempting any close continuous tracing of the several coals, which can only be done as the consummation of an elaborate and protracted survey, I may exemplify the variability of these coal measures by appealing to the very different types which they assume in the three meridians of Solomon's Gap, south-west of Wilkesbarre; Spring Brook, south-east of Pittston; and the vicinity of Scranton.

At Solomon's Gap, this group of lowest coal measures, extending from the foot of the mountain north-west across the basin to the edge of the diluvial flats of the Susquehanna, includes in a thickness of nine hundred or one thousand feet as many as thirteen beds of coal of various sizes, from one foot to nineteen feet, and the total thickness of coal, fit and unfit for mining, embraced by this section, may be estimated at nearly eighty-four feet. But out of this aggregate quantity, the thickness susceptible of being profitably wrought, does not probably amount in all to more than forty-five or fifty feet. Traced eastward and westward, these coal-beds undergo, even in the space of two or three miles, some very remarkable variations. Thus the fifth in position from the bottom, from a thickness of seventeen feet at Solomon's Gap, enlarges in that distance to the noble bulk of twenty-eight feet, opposite to Wilkesbarre, beyond which neighborhood it seems again to decline even more rapidly than toward the south-west. These fluctuations arise partly through the coalescing of two or more beds into one, or conversely through a splitting and diverging of the thicker seams into two or three

thinner ones, or partly, again, by the gradual alterations of size of the same coals, independently of such unions and subdivisions.

If we turn now to the district of Spring Brook, we shall find all the features of the formation so altered as to present not one subdivision, neither coal-bed nor other stratum, which we can recognize or identify as a member of the series visible in the vicinity of Solomon's Gap. In a total thickness of several hundred feet of coal measures, embraced between the out-crop of the Main Pittston seam and the conglomerate of the mountain to the south-east, only six coals in all, according to the largest estimate, have ever been brought to light, after close and persevering researches there, and only two of these appear to have a size and purity adapting them for successful mining. There would seem to take place between the Solomon's Gap, or Wilkesbarre neighborhood, and this quarter, a progressive impoverishment of these lower strata in the number and size of their included coal-beds, and likewise a considerable thinning down of the entire formation. As a result, this portion of the southern skirt of the valley maintains at this time no collieries of any magnitude.

Another and opposite change, back to a very productive condition of the coal measures, is exhibited as we continue our progress along the same side of the basin north-eastward up the Lackawanna valley and approach the vicinity of Scranton.

In the immediate neighborhood of Scranton, a portion of the coal basin where the coal measures are unusually well developed by natural features in the topography, and through the researches directed by the companies, the coal rocks, counting from the upper surface of the seral or lower conglomerate to the highest sandstones of the *plateau* south-west of Hyde Park Village, disclose, upon careful measurements, an aggregate thickness of about seven hundred feet; and in this depth of strata the whole number of coals, large and small, amounts to no less than twelve, not estimating as separate seams any layers which might be regarded as subdivisions of compound beds. The assembled thickness of these twelve plates of anthracite is not less than seventy-four feet, taking for some their mean, for others their minimum dimensions; and the thickness available for market, under judicious mining, I would estimate at thirty-nine or forty feet.

To bring out in a clearer light the remarkable productiveness of this portion of the lower coal measures as they present themselves near Scranton, I will assemble, in a tabular form, the actual least thicknesses of the several coals within this bulk of strata, their net thickness of good coal fit for market, and the computed yield of such coal per acre from each bed.

TABLE.

Coals.	Least thicknesses.	Good coal.	Yield of good coal per acre.
K,	5 feet	3 feet	4,000 tons
I,	7 "	4 ½ "	7,000 "
H,	10 "	7 ½ "	12,000 "
G,	6 "	3 "	5,000 "
F,	12 "	9 "	15,000 "
D,	8 "	6 "	10,000 "
C,	6 "	4 ½ "	7,000 "
	54 feet	37 ½ feet	60,000 tons

These totals hold good of course, only for those portions of the coal-field which are underlaid by all the seven coals enumerated. If we wish to aggre-

gate the gross amount, the net amount, and the amount per acre, contained in the four middle beds, D, F, G, and H, which lie within a thickness of strata of two hundred feet, and spread beneath every acre of the coal-field, excepting only a narrow belt along its southern border, we shall find, on summing up the columns of the table, that the least total thickness of these coals is thirty-six feet; their yield in thickness of good coal, upward of twenty-five feet; and their productiveness per acre, the noble ratio of 42,000 tons.

CHARACTERS AND QUALITY OF THE SCRANTON COALS.

As a group, these Scranton coals are to be classed with the free-burning, white-ash anthracite, a very valuable variety, uniting the strength, or great *heating power* for which the true anthracites are preëminent, with that readiness of kindling and activity of combustion which distinguish the firmer semi-anthracites, and which the densest and hardest coals do not possess. Both in structure and composition the more ignitible of these coals hold a station apparently intermediate between the most compact anthracites nearly destitute of inflammable gases, and those more fissured and lighter varieties containing a notable amount of the carburetted hydrogen gases, and which I have elsewhere denominated the semi-anthracites. While the dryest and densest anthracites include about three per cent of their weight of inflammable gases, and the semi-anthracites, some seven or eight per cent, these Lackawanna coals, on the verge, as it were, of the class of anthracites or flameless coals, possess an average as much as five per cent of these free burning elements.

In point of purity or freedom from earthy matter, these coals of the vicinity of Scranton will compare favorably with the beds of the corresponding lower white-ash group of the Lackawanna and Wyoming basin generally, and, indeed, with the better class of anthracites anywhere throughout the coal region. Analysis shows that the portions which are mined for transportation contain not more than six or eight per cent of ashes, and this, it is well known, is a low proportion for merchantable anthracite coals. The earthy residue of these coals, being of the kind called white ashes, consisting chiefly of silica and alumina, and containing but little alkali, lime, or oxide of iron, and being capable therefore of withstanding a high heat without melting, or more than softening into a spongy cinder, are exempt from the serious defect of producing the hard, stony clinker caused generally by the red ash, and often by the so-called gray-ash anthracites.

The proportion of solid carbon—the amount of which in coals, from the best practical researches on fuel, must be accepted as very nearly the measure of their absolute heating strength—is, in the instance of these Scranton anthracites, about eighty-seven to eighty-eight per cent of the whole mass, a ratio only about two per cent less than distinguishes the dryest or least gaseous varieties in the Lehigh coal-fields, while the difference is amply compensated for in the gain of this amount of ignitible, inflammable gases—hydrogen and carburetted hydrogen—which serve materially to increase the promptness of kindling and rapidity of burning, or the total amount of heat evolved in a given time.

These Scranton coals, in their comparative purity or freedom from earthy matters, and large amount of carbon in their possession of a moderate density and some free inflammable gas, and in their square mode of fracture, combine in a high degree the three chief essential attributes of a superior fuel, namely, great absolute heating strength, quick ignitibility or activity of com-

bustion, and the power of packing closely. Other coals may surpass them in some one of these qualifications to a small extent, but I doubt if, on a fair experimental comparison of properties, any will be found to combine a larger total of efficiency in all these several ways.

With a view to exhibit more distinctly the excellences of the class of free-burning white-ash anthracites, such as these I have above described, I will conclude this essay with a condensed survey of the principal qualities essential to a

GOOD FUEL FOR PRODUCING STEAM, OR FOR DOMESTIC USES.

1. It should possess great actual heating power.
2. As far as consistent with the foregoing, it should kindle quickly, and burn fast, generating the largest amount of heat in the shortest time.
3. Its earthy matter should be small in quantity, and difficult to fuse; it will thus make little clinker, demand but little raking of its fires, and undergo but little waste in consequence.
4. It should contain but little sulphur.
5. The volatile ingredients of the coal should be free inflammable gases, not bituminous matters forming smoke; and they ought to be barely abundant enough to assist rapidity of combustion, as the larger the proportion of fixed carbon, the greater seems the heating power.
6. They should not be too tender on the fire, nor yet too refractory: a certain tendency to fall to pieces spontaneously while burning, but not an over amount of this, is a great desideratum, as it confers activity and steadiness of combustion; too much of it impedes combustion by increasing the friction of the air passing through the fire.
7. The lower the temperature at which an anthracite will kindle and maintain itself burning the more manageable, more active, and more economical will it prove.
8. The better a coal unites the tenacity necessary for economical transportation, with this medium amount of frangibility on the fire, the larger the effective result of a given quantity, from the time it leaves the mine.
9. And the greater the aggregate of positive heating power, rapidity of combustion, and compactness of stowage compatibly assembled in a coal, the nearer does it approach the ideal standard of a perfect fuel.

WILLIMANTIC (CT.) AND ITS FACTORIES.

THE river which has given name to this village, rises, unless we mistake, in our own State, in quite a secluded region, and then, after tumbling over the water-wheels of one or two furnaces and as many cotton-factories, in the town of Stafford, passing near Stafford Springs, it forms the boundary between Willington and Tolland, Mansfield and Coventry. Then, it sweeps away to the east, and in the bend, where its waters rush over immense beds of gneiss, (which rock, by the way, will split almost as freely as the native chestnut,) in the north-western section of the township of Windham, lies the village from which we now date. Thirty years ago, a dozen houses would have accommodated the population then basking in the sunshine of these waters, where now reposes a population of some two or three thousand, in the space of a

mile. At a place known for miles around as *the Slate*, for many years had been located a grist-mill and paper-mill. And here it was the writer, as he came from his father's farm with a couple of bags of wheat to be ground, learned to make paper in the old-fashioned way. Since, however, he has, in a like manner—namely, by looking on!—learned to make paper by at least two kinds of machines. Between the years 1820 and 1830, four companies, or prominent individuals, commenced their operations. One of these commenced in mills known as the Carpenter establishment. The next above on the stream was the mill or mills built and owned by the Messrs. Jillson. These gentlemen, men of enterprise, did much for the village. They were originally from Massachusetts. Dea. Lee, a gentleman well known in the vicinity, commenced the mill next above. The uppermost mill, or mills, were constructed by a company from Providence, whose agents were the Messrs. Tingley. At the time referred to, mill privileges were in demand. Agents of cotton-factory companies were then threading their way up and down the rivers and brooks to find a good place for a factory site. Then the railroads had not opened an access to hundreds of such places back in the country. The water in this stream is now used five times in the space of a mile, including the old grist-mill and paper-mill. It is believed that one of the best sites in the village remains still unoccupied, where the water can be used again to propel machinery. Some of the cotton-mills are of the largest class, and once were filled with the most delicate machinery, and turned out some of the finest fabrics in the country. In whose hands, and by whom occupied, are these large rock-built establishments at the present time, the writer has not learned.

One thing which renders Willimantic desirable as a place for factory sites, is the building material, already referred to, found not only in the bed of the river, but jutting out from its banks, and underlying the ground in various localities. This stone, by natural seams, splits very regularly into masses from six inches to a foot thick. Then the converging railroads are destined to make this beautiful, romantic, and rising village accessible from almost every point of the compass. The New-London and Palmer Road opens a communication with Norwich, fifteen miles distant, with New-London, New-York, and all the world; also, on the north, with Massachusetts, Vermont, New-Hampshire, the Canadas, and, if you please, the North Pole. Then comes the Providence, Hartford, and Fishkill Road, completed from Hartford to Willimantic, and almost finished from Willimantic to Providence. These two roads, running for some distance side by side, cross each other at grade at the depot. Finally comes, or rather *is coming*, the Air-Line Road, uniting Boston and Middletown, New-Haven and New-York; all meeting here, give the village greatly the advantage over almost any other in the neighborhood or in New-England. Then another thing rendering the locality desirable, is the perpetuity of the waters of the river. These, in the very dryest season, rarely fail. And here I would observe, that about three or four miles above the village empties one of the choicest streams, and at the same time most useful, which flows on the face of the globe. It is a stream issuing from Coventry Pond, a large sheet of water, fed entirely by springs, and situated some two hundred feet above the bed of the Willimantic. On this stream, in the space of two miles, are situated eight or ten mills in succession, with room for more, all governed by the grist-mill as to the amount of water. And there flows that pure, limpid stream, right from the bosom of the earth, in a perpetual flood, just so large, year in and year out, without any increase from the descending rain or the dissolving snow, or any diminution from the parching drought. It is a perpetual fountain, a real god-send to the village of Willimantic.

The village at the present time contains, I should judge, about five hundred families. It contains three church edifices—a Congregational, a Baptist, and a Methodist. Business is here ever quite lively, yet I understand complaints come from the merchants that the railroad facilities carry all their customers to Norwich and New-London, on the one hand, or to Hartford on the other. Their complaint may be founded in reason; but what is their loss is the gain, not merely of the cities mentioned, but of the people in and around the borough of Willimantic. Ever would we have the sunshine of prosperity fall on this village, this monument of Whig skill, foresight, and enterprise; for every manufacturing village in New-England is a monument, more durable than brass, of the benevolence, the far-sightedness, the energy, and the true patriotism of Whiggism. Yours, truly, J. S.

DETROIT.

A CORRESPONDENT of the *Portland Transcript* writes as follows:

Unlike most other Western cities, Detroit is situated upon high land, which rises from the water-level to the height of thirty-five or forty feet. It is situated upon the west bank of the Detroit River, about four miles from its source and twenty-four from its mouth.

The waters of Lakes Superior, Michigan, Huron, and St. Clair, that move eastward to the Atlantic, find an outlet only through this river. It rises in Lake St. Clair, pursues a southerly course, and discharges its pure water into the noble Erie. It is broad and deep. Opposite the city it is three quarters of a mile wide, and as deep as can be desired, being twenty feet deep at the docks, and not far from fifty feet deep in the middle of the river.

The principal streets run nearly parallel with and at right angles to the river. They extend for miles in as straight a line as the needle can dictate; they are all very wide, and shaded on either side with a double row of young thrifty trees. Jefferson avenue, the Broadway of Detroit, runs a little to the east of north; it is four miles in length; the side-walks are each fifty feet wide, and the street proper is one hundred feet. This gives a spacious avenue of two hundred feet in width! It, with other principal avenues, is paved with limestone. Let the traveller promenade the walks of this avenue, on some bright summer's day, and he will find himself shielded from the sun by the overarching trees; and as he passes on and notices the stately brick mansions, whose attractiveness is enhanced by tasty yards of shrubbery and flowers, observing the "city-fashions," and people moving to and fro, afoot and in elegant vehicles, he must pronounce Detroit a city not wanting in beauty or interest. The dwelling-houses and stores are mostly built of brick and wood. No granite is to be found in this Western country. All the stone is composed of lime.

The well-water of the West is unhealthy. But this source of ill is here obviated by using the water of the Detroit River. It is pronounced by chemists as healthy as any water in the world. Water-pipes ramify all parts of the city, and the steam-engine, like the heart, sends the water coursing along through these deep-seated arteries, to give health and animation to 35,000 human beings.

And not only will the traveller find Detroit possessed of beauty and health, but he will find it a city of business. Her commerce is extensive, being in

good communication with five inland seas, and all their tributaries and outlets. Her harbor is pronounced one of the safest on the lakes. Her docks extend over three miles. Two railroads terminate here, the Michigan Central and the Pontiac—the first at the south and the latter at the north end of the city. The first is 282 miles in length, extending across the entire State of Michigan to Chicago, the "New-Orleans of the North." It adds much to the business and wealth of the city. Its earnings last month amounted to over $109,000, which, like the ocean-tide, must ebb and flow, replenishing the poor man's pocket and adding to the rich man's "pile." The Pontiac road is but twenty-five miles long, but in one or two years it will be extended to Grand-Haven, 280 miles, a port on the eastern shore of Lake Michigan, nearly opposite to Milwaukee. Detroit was settled by the French in 1670. Its population is made up of people from the New-England, Middle, and Western States; and I doubt not but every state of Europe is here represented.

A MAINE BOY.

A NEW TREE.

A BEAUTIFUL tree, unknown to other parts of the Union, is thus described in the *Oregon Times:*

Mr. Quincy A. Brooks has placed before us the branch of a tree or arboret, accompanied by the following communication:

A strange and beautiful tree has been discovered in Washington territory, which is not known to exist in any other part of the habitable globe. The tree is destined, I think, to make some noise in the world. It is remarkable, because its like is not to be found elsewhere, and on account of its great beauty and fragrance. The tree varies in height from one to seven feet; the leaf resembles that of a pear, while the trunk and branches look like those of the orange tree. The upper side of the leaf is thinly coated with a gum having the appearance of oil, and of the consistence of honey. Handling them causes the gum to adhere slightly to the fingers.

The gum, as well as the leaf and bark, is highly odorous. The fragrance, which is quite strong, resembles that of bergamot, or ripe fruit, and a few leaves are sufficient to perfume a room. A leaf, fully wrapped up in paper, so as to be entirely concealed, was handed to several persons, with a request that they would tell by the smell what it was. All expressed themselves highly delighted with the fragrance, but gave different answers as to its character. Some said it smelled like ripe pears; some said that it was bergamot; whilst others thought it smelled like ripe apples. The flower resembles that of the white jessamine.

This will certainly make a very beautiful and desirable ornamental tree to grow in our gardens, around our dwellings, near the parlor window, or to form a choice bower. Its intrinsic value for these purposes is greatly enhanced by the consideration that it is an evergreen. The specimen is brought from my farm, and is taken from a grove of about a quarter of an acre. The plant is very rare, even here. The oldest settlers of the country say they never saw it growing elsewhere. Still, I have no doubt it will be found in other places. It has been known to the priests of the Mission of St. Joseph, for some years, but has not attracted attention until recently.

THE NEWER DECIDUOUS TREES AND SHRUBS.

BY HENRY W. SARGENT, WODENETHE, FISHKILL LANDING, N. Y.

The last No. of the *Horticulturist* contains the following, under this title: it is written by a skillful amateur, and is worthy of especial consideration. We commend the suggestions and opinions as entitled to more than ordinary consideration. Most of our readers know that "deciduous" trees are those which lose their foliage in the fall:

In addition to the more common and usually planted deciduous trees and shrubs, there has been a great and very charming accession to our ornamental plantations, within the past five or six years. The searches of Dr. Hooker, Messrs. Fortune, Douglas, and the other collectors of the Royal Botanical Garden, at Kew, and of the Duke of Devonshire, have been attended with the greatest success; in addition to which, our own active intercourse with California has very materially increased the variety, which is now becoming gradually acclimatized and adopted into the gardens and pleasure-grounds in this country.

Among the many new and beautiful plants which seem to have proved perfectly hardy, even as far north as Albany, and perhaps further, the *Forsythia viridissima* and the *Weigela rosea*, are among the most attractive; the former, one of our earliest and most profuse blooming spring shrubs; and the latter, covered with its roseate flowers from the middle to the last of May, partaking somewhat (though much more beautiful) of the character of the Fly Honeysuckle.

Among the newer Magnolias, the *M. fuscata, cordata, Frazeri, longifolia, striata*, and *gracilis* all prove quite as hardy as the *conspicua, Soulangeana, tripetala, acuminata, macrophylla, glauca*, etc., all of which, say twelve or more, are quite hardy here, and should be in all collections.

To this portion of plantations, which all flower about the same time, should be added the *Pawlonia imperialis;* the different varieties of Hawthorn—the single white, red, and pink, [these three grafted on the same stock, have a pretty effect,] the double white, the double red, and the variegated leaf; and the *Andromedas*, [these are evergreens.] The English Azaleas, than which nothing can be more brilliant and gorgeous, and the newer Belgian varieties; the TRUE *Deutzia gracilis* and *Deutzia scabra;* and the *Ribes sanguinea*, (double,) the *Ribes Gordoni*, and the *Ribes speciosa* are all beautiful and rare. The double-flowering Sloe, the double-flowering Plum, Peach, Cherry, and Apple, and the *Spiræa prunifolia*, are all beautiful. To these add the double pink, white and yellow Horse-Chestnut, and the dwarf Horse-Chestnut, all blooming in quick succession.

There is no end to the Spiræa family, and they abound in beauty. The many are well known. *Lindleyana, Douglasii, Reevesii*, and *prunifolia*, are among the newest.

The Chinese Wistaria, if trained to a pole eight or ten feet high, and kept well cut back for some years, will, in process of time, have all the beauty and appearance of a weeping tree, and what is even more valuable, bloom in succession all summer.

The French and African Tamarisks are pretty and hardy.

Among the variegated trees and shrubs, the variegated Sycamore, Oak Elm, Beech, Chestnut, Maple, Horse-Chestnut, Syringa, Euonymous, Currant,

and Thorn all do well upon this place, and are striking and interesting varieties. The variegated-leaf Dogwood is very rare and curious.

The cut-leaved family is also very curious. The prettiest of these are the cut-leaf Beech, the cut-leaf Horse-Chestnut, and the cut-leaf Ash; though the cut-leaf Linden, and cut-leaf Birch, are desirable in a collection. [The cut-leaved Birch is, to our taste, one of the most elegant trees recently introduced.—Ed.]

The purple trees and shrubs are the copper and purple Beech, the purple Filbert, and the purple Berberry. A few of these intermingling with the fanciful, gay foliage of the variegated Sycamore, Syringa, Thorn, etc., have the prettiest effect, if not overdone, or too much or too glaringly exposed.

The weeping trees are now generally so well known as hardly to require mention. The old and new Weeping Birch; the lanceolate-leaved Weeping Birch; the green and purple Weeping Beech; the old green, the yellow, and the lanceolated Weeping Ash; the Weeping Sophora; the Weeping Horse-Chestnut, Oak, Elm, Poplar, Thorn, Laburnum, Cotoneaster, Peach, Cherry, (three varieties,) Euonymus; beside half a dozen more of the smaller shrubs, grafted standard high, and allowed to weep down, such as the *Caragana arenaria, Euonymus linifolia, Caragana frutescens, Cytisus lessifolia*, etc.

One of the most desirable and beautiful trees, at this season, is the *Virgilia lutea*—beautiful in its habit and foliage, and exquisite in its bloom.

The purple and oak-leaf Laburnum are worth a place in any shrubbery. The oak-leaf Hydrangea is quite hardy and desirable.

For hedging, the most beautiful are the Hemlock, the English Yew, and the Beech; the most serviceable, the Buckthorn, Washington Thorn, and Osage Orange.

Among the Elms, the *Ulmus glabra pendula*, the Scampston Weeping, and the Camperdown Weeping are very remarkable.

There are a good many fine foreign Elms, not pendulous in their character, yet well worth planting, such as the Chichester, the Cornish, the Exmouth, the Huntington, the English Cork, the Dutch Cork, the Scotch and the English Upright—a most valuable tree, from its property of retaining its foliage green, long after the surrounding trees are stripped.

Among the rarer Maples, are the silver-striped leaf; the Norway, (the finest, I think, of all Maples:) the *Acer Tataricum;* the English, with a very dense, round, habit of growth; and the purple Maple, with leaves of a rich dark green externally, and of a chocolate brown underneath.

Beside the Ashes above enumerated, are the Willow-leaved; the Aucuba-leaved, blotched with yellow, like the *Aucuba Japonica;* the Myrtle-leaved; and a new and pretty variety originated, I believe, with Messrs. Ellwanger and Barry.

The Turkey, the Overcup Oak, and the English Royal, Lucomb, and Fulham, and our different American varieties, are, of course, all desirable, where the size of the place will admit.

I shall end this chapter with one more tree, which to my taste is, among deciduous trees, one of the most graceful and fairy-like of all of the large collection I have here, and that is the new Weeping Larch, grafted twelve feet from the ground, and certainly most charmingly graceful in its swaying, pendulous habit, as much so as the Weeping Willow.

THE FIG.

THE *Fig*, (Fiscus Carica) should be generally cultivated throughout the Southern or planting States, on account of its healthy and magnificent dessert fruit; and the best and most approved varieties imported by our intelligent and enterprising Southern nurserymen, from Italy, the shores of the Mediterranean, and the South of France and Spain, where new and extra rare and choice varieties are yearly springing up, and I trust ere long will be produced in like manner in the South, particularly in that El Dorado of a climate, Southern tropical Florida. The few isolated varieties now in cultivation with Americanized names, induce me to furnish you with a correct description of a few of the rarest and most approved varieties of the fig. It is by forming such a collection of names, and by a judicious comparison of the fruits, that we are to arrive at any degree of perfection in the naming or selecting of fruits. Apropos: the fig-tree delights in a *light, rich soil, which is supplied with water within the reach of the roots.* Its nature is to produce two crops in the year. The first crop, which is produced on the points of the shoots of last year; the second crop is produced on the shoots of the current year. Among the best varieties grown are the following:

1. *Brown Ischia.*—Fruit globular, with a pretty large eye; large; pinched in near the foot-stalk; color brown or chestnut on the outside; purple within; flesh sweet and high flavored, containing large grains; ripens in July; will produce two crops annually; originally from the island of Ischia.

2. *Black Genoa.*—Fruit long, swelling pretty large at top, where it is obtuse; the lower or part next the foot-stalk very slender; color dark-purple, approaching to black, having a delicate bloom over it, like some sorts of grapes and plums, which is easily destroyed by handling; inside color bright red; flesh high flavored; ripens early.

3. *Early White.*—Fruit small, roundish, somewhat flattened at the crown; foot-stalk very short; skin thin; color white; when fully ripe, of a whitish-yellow; inside color also white; flesh sweet, but not very high flavored; ripens in June. Under favorable circumstances produces two crops annually.

4. *Genoa Large White.*—Fruit large, globular, somewhat lengthened toward the stalk; skin thin; flesh high flavored; color yellowish when ripe; inside color red; ripens about the end of July. Will, under favorable circumstances, produce two crops annually.

5. *Black Ischia.*—Fruit short, middle-sized, somewhat flattened at the crown; color black when ripe; inside color deep red; flesh very high flavored; ripens in June; an excellent bearer; originally from the island of Ischia.

6. *Malta.*—Fruit small, much compressed at the top; much pinched toward the foot-stalk; color brown, both outside and in; flesh very sweet and well flavored; ripens in June, but when left to shrivel on the tree becomes very delicious.

7. *Murray, or Brown Naples.*—Fruit rather largish, globular; color light brown on the outside, with faint marks of a dirty white, the inside of nearly the same color; flesh well flavored; ripens about the beginning of August.

8. *Blue, or Purple.*—Fruit pretty large, oblong; color dark-blue or purple; is a good bearer; ripens early and produces two crops annually.

9. *Naples, Large Black.*—Fruit long, somewhat compressed at the ends;

foot-stalks pretty long; leaves more deeply divided than in most other varieties; color dark-brown when fully ripe; outside color inclining to red; flesh high flavored.

10. *Italian, Brown Naples, Brown Turkey, Brown Italian.*—Fruit small, or middle-sized, obovate; color, both outside and in, brown; flesh rich and delicious; is of slender habit, and well calculated to force when planted in pots or small boxes.

11. *Green Ischia.*—Fruit oblong, almost globular at the crown; skin thin and delicate; color green, but when ripe, the purple flesh shines through the thin skin, and gives it the appearance of being stained with purple; the flesh high flavored.

12. *Brunswick, Hanover, or Madonna.*—Fruit long, pyramidal; very large; skin pale, green on the shaded side, next the sun of a brownish-red; flesh pinkish, extremely rich, sweet, and high flavored; the leaves deeply and more beautifully divided than in any other variety. This is said to be one of the most useful of the hardy figs. It is, perhaps, the largest purple fig we have, and the most useful variety that can be selected for a small garden.

13. *Marseilles, White Marseilles.*—Fruit small; the skin pale green; flesh white, dry, sweet, and rich; is admirably calculated for the forcing-house.

14. *Gentile.*—Fruit middle-sized; color yellow when ripe; flesh of nearly the same color; ripens late, and is a bad bearer.

15. *Lee's Perpetual*, originated by Mr. Lee, of Hammersmith-Nursery, is said to be one of the best bearing figs we have, and should be introduced nto all fig-collections.

16. *Ischia Small Brown.*—Fruit pyramidal and small, with very short foot-stalks; color brown; flesh inclining to purple; very high flavored; and is an excellent bearer.

17. *Ischia Yellow, Cypress.*—Fruit large, pyramidal; color yellow when ripe; flesh purple and well flavored; leaves large and not much divided; tree grows luxuriantly; a shy bearer.

18. *Nerii.*—Fruit rather less than the Marseilles, and more long in shape; skin pale greenish-yellow; pulp similar in color to that of a pomegranate; much the richest fig known; there is in its juice a slight degree of very delicate acid, which renders it peculiarly agreeable to most palates.

19. *Pregussata.*—Fruit large; skin reddish-purple; pulp deep red; remarkably rich, sweet; seed unusually small.

20. *Small Brown Ischia.*—Fruit small; skin brown; pulp purple, of a very high flavor; leaves less divided than most sorts.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

GOLDEN OR BASKET-WILLOW.

MESSRS. EDITORS: I have the pure golden or basket-willow, and could furnish several thousand cuttings for planting to any person who wishes to raise it. It will make good cotton-baskets, or fruit or work-baskets. Should any person desire cuttings to plant, send me their address and number wanted, and (10) ten cents a-piece, I will box them up and forward as directed.

Yours, very respectfully, G. W. BERFORD.

College-Hill, Miss.

NATURAL COKE IN VIRGINIA.

At a recent meeting of the Boston Society of Natural History, Prof. Wm. B. Rogers communicated some observations recently made by him on the *Natural Coke* and the associated igneous and altered rocks of the oolite coal region in the vicinity of Richmond, Virginia. In the district on the north side of the James River, where the most valuable seam of coke has been explored, it is at present wrought by two vertical shafts. In that nearest the out-crop, the coke is reached at 112 feet from the surface, in the other at 207 feet, the dip of the coal-measures being nearly west, and at a low angle. A third shaft, recently wrought, which lies nearer the margin of the basin than either of the preceding, cuts the stratum of coke at the depth of 90 feet. A bed of whinstone, or coarse, gray trap, is intercalated in the coal-measures of this part of the basin, intersecting the two first-mentioned shafts, but cropping out a little west of the third. This bed is met with in the deepest and most western of the shafts, at a distance of about 100 feet from the surface, and is more than 30 feet thick where it is cut through, but in the next shaft it is at a depth of less than 30 feet, and has thinned down to about half the preceding thickness.

One of the most remarkable effects produced by this igneous bed is seen in the stratum of carbonaceous fire-clay which lies next beneath. This, which in the second shaft has a thickness of 11 feet, has been greatly indurated and made to assume a columnar structure, by which the whole mass is converted into a congeries of closely-packed five and six-sided prisms, often quite regular, usually about half an inch in diameter, and always at right angles to the lower surface of the trap.

A portion of this bed, originally occupied by impure coaly matter, presents the same columnar structure, but the material is a compact plumbaginous coke, with much earthy matter intermixed. The general aspect of the gray part of this bed strongly resembles that of the coarser varieties of fire-brick after they have been long exposed to intense heat. This is what might be expected; for in the bed in question we have the very material of fire-brick, and in the overlying trap we have a source of igneous action, which, in the originally molten condition of this substance, could not fail to work great changes in the contiguous strata. This columnar indurated clay, or natural fire-brick, when recently broken, emits a most offensive odor, partly that of sulphuretted hydrogen, and partly, perhaps, caused by a sulphuret of carbon.

At the depth of about 70 feet below the bottom of the trap, occurs the bed of natural coke for the mining of which chiefly these openings have been made. This interval below the fire-clay is occupied by bluish and drab argillaceous and sandy slates, with some coarse sand-stone, the former abounding in impressions of plants, among which may be noted Equisetum columnare, Zamites oblusifolius and Taeniopteris magnifolia, forms which many years ago Prof. Rogers pointed out as marking the oolite age of these coal-bearing strata. The baking action of the trap is curiously shown in all these fossils. The coaly matter of the stems and fronds, when closely examined, is seen to be blebby or blistered. It is, in fact, coke, which, while it retains the outlines and stronger markings of the plant, has in its partial fusion obliterated all the finer characters of the organized surface.

The coke, where it has been successfully mined, forms a bed about five feet thick, including but little slate, and presenting nearly a homogeneous mass of

a bluish-black color, uniformly vesicular and light enough to float in water. It retains only a minute fraction of the volatile ingredient of the unaltered bituminous coal of this region, but it ignites readily and burns like the compacter kind of ordinary coke. Throughout the bed, but especially toward the top, it presents a partially columnar structure. Where this structure is marked, the coke is found to crepitate when heated. In some localities on the south side of the James River, where the whole mass of coal and adjoining shale has been rendered completely columnar, the material, in the process of heating, breaks up with an explosion like the crack of a pistol, at the same time projecting its fragments to some distance from the grate.

The gradually diminishing influence of the trap-bed, as we recede downward, is illustrated by the section in one of the shafts, which embraces a thickness of fifty feet of strata below the seam of coke above described. After passing through indurated fire-clay, lying immediately beneath the coke, we have a thickness of about twenty feet of slates, followed by a thin seam of semi-coke, or coky coal—more bituminous below than at top; and after this, descending through some twenty feet more of slates and sand-stones, we come upon a bed of bituminous coal, which appears to have sustained no alteration beyond the development, throughout the mass, of a columnar structure. In the deepest of the three shafts, the seam, now wrought under the intelligent direction of Col. Worth, corresponds to the coky coal above described, the lower layer retaining much of its original bitumen. In all these workings the gradation of metamorphic influence is beautifully marked within a distance of less than fifty feet of strata, from the greatly altered shale or fire-clay immediately beneath the trap, through the successive slates and coke-seams, to the unchanged bituminous coal at the bottom of the section.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

AGRICULTURAL SOCIETIES OF MASSACHUSETTS.

My Dear Sirs: In an interesting article in the last number of *The Plough, the Loom, and the Anvil* on government patronage, taken from *De Bows' Review*, I notice that our little State of Massachusetts is credited to "twelve agricultural societies, and in many of these societies several counties together." Since reading that excellent article, it has occurred to me that some more facts, with regard to the agricultural progress of our "Ancient Commonwealth," may not be uninteresting to your general readers, while at the same time they operate as a stimulant on some, to increase the number of similar institutions through the country.

There are now in Massachusetts sixteen incorporated agricultural societies, all in successful operation. These societies hold, in the aggregate, property to the amount of $109,911.10, and have in permanent funds, $92,816.54. Three of them, Norfolk, Worcester, and Middlesex, hold real estate as follows: Norfolk to the value of $6129.95; Worcester, $5964; Middlesex, $2000. The disbursements of all these incorporated societies in 1853 were $21,014.89. The amount paid to them by the State, in that year, was $8782; receipts from new members and donations, $6376.50. Each of the societies, except Barnstable, receives from the State $600 a year, and this society has $362. The amount paid in premiums by the several societies the last year was $9064.73, which was divided among about two thirds of the towns of the commonwealth.

The fairs and exhibitions of these societies are held in September and October, and the most of them continue two days.

The Massachusetts Society for the promotion of agriculture was established in 1792, and in due time a list of premiums was offered, and an exhibition held at Brighton, the great mart for selling cattle and other animals for Boston market; and a ploughing match was instituted in connection with these cattle shows. The Society still exists, with a fund of $23,500, and an annual income from the State amounting to $600, but holds no annual exhibition. Their expenditures in 1853 were $600; for a course of lectures on the horse—of which we suppose the resident members had the benefit; we are sure the people had not—$460.74; for care and keep of the Society's Alderney stock, $250; paid in premiums at the Springfield national exhibition of horses, and miscellaneous expenses, $45.62.

Its principal benefits have heretofore arisen from its importation of valuable animals, of whose use kindred associations in the State have had the benefit by a gratuitous loan, so that in its former proceedings its influence has been more like that of an auxiliary than of a parent institution.

The Kennebec Agricultural Society was instituted at Augusta, in the State, (then province of Maine, and associated with Massachusetts,) in 1800, and incorporated in 1801. This Society, of course, ceased to be an appendage of Massachusetts on the separation of Maine, and its admission as a new State in 1820.

An Association of Farmers was formed in Middlesex County in 1796, and incorporated in 1803, under the style of "The Western Society of Middlesex Husbandmen," a name which was afterward changed by the Legislature to "The Society of Middlesex Husbandmen and Manufacturers," and now known, we believe, as "The Middlesex Agricultural Society."

The first agricultural exhibition in Berkshire was held in 1809, and consisted mainly of a pair of Merino sheep, introduced by the Hon. Elkanah Watson, who was a principal actor in the formation of the Berkshire Agricultural Society, which was instituted in 1810, and incorporated in February, 1811. The utility of this Society is now manifest in all parts of our county. How far its salutary influence may have extended into other sections, we have no positive means of saying. The Hampshire, Hamden, and Franklin Society, embracing the territory of the old county of Hampshire, and covering the beautiful and luxuriant valley of the Connecticut, from Connecticut to Vermont, with the summit of the Green Mountains for its western, and the hill of Worcester for its eastern boundary, was formed in 1818. The same year similar societies were formed in Worcester and Essex counties.

The favor in which these elder associations have been held in their respective districts, is shown by the fact that in Worcester county there are now three incorporated agricultural societies. In Hampshire, Hamden, and Franklin, there is an incorporated society in each county, which, with the parent society, makes four, besides at least three highly prosperous ones, which are at present unincorporated.

In Berkshire, it was found, some years since, that in consequence of the extent of territory, the parent society did not fill the wants of the population, and a coöperator was planted in South-Berkshire, which, if it has not the age, has the beauty and strength of the county society. Although some jealousies existed in the early history of the new society, and doubts were tolerated as to what its eventual influence might be, yet time has fairly buried the jealousies beyond the chance of a resurrection, and the doubts which have hovered over its path have passed away like the morning vapor, which

passes over the earth, to awaken new beauty in its flowers, and give freshness to its verdure, when the advancing sun lends his more potent rays to smile on the freshness that greets it in its pathway. The two societies have long worked in beautiful harmony, each happily advancing the prosperity of the other.

In horticultural matters the advances of the State are well known. The Massachusetts Horticultural Society has a reputation too well known to need a comment. Nearly every county now sustains similar institutions, and the improvements they seek to promote are becoming frequent everywhere.

A Board of Agriculture was established in 1852, which employs a secretary, paid by the State, and its benefits are becoming more and more appreciated, as they more fully develope themselves.

But there is another wheel, humble as it may be, in this machinery of rural improvement, whose benefits can not be over-estimated. This is the Farmers' Club, several of which have been in existence long enough to test their value and render them favorites wherever they have been sustained. Several of them, which may yet be more fully noticed, exist in the western part of the State, while within the last year their number has been beautifully augmented in the eastern counties.

Yours truly, W. H.

Elmwood, June 13, 1854.

MINERAL MANURES—COM. THOS. AP CATESBY JONES.

We find that this eminent gentleman is engaged *con spirito* in the science and practice of agriculture, and thus expresses himself in relation to some very important topics:

Of all the concentrated natural and chemical manures, now in general use by farmers and gardeners, Peruvian guano is decidedly the favorite. It may not always be so. It ought not now to be the case. That upon extremely poor lands, incapable of vegetable production without the use of powerful stimulants, 200 pounds of guano per acre will produce an astounding crop of wheat, etc., can not be denied; and a clover-seed be sown with the fall crop, or on it, in early spring, a fair crop of clover may follow next year, if the season be favorable; and if this clover be well plastered and ploughed down in June, and again ploughed and seeded with rye or wheat in August or September, there will be an improved base to work on, by a regular rotation, such as I have already laid down, which must be pursued, or the benefits of the guano will be lost, and the land will be in a worse condition than ever. But guano should not be applied the second time to the same land, unless in combination with other fine manures; nor should it ever be applied in its crude state to land that is in good heart, that is, land that will bring thirty bushels of Indian corn or fifteen bushels of wheat per acre, without it. Not but that guano on some such land might increase the product of both wheat and corn enough to pay for itself, but if it should, the soil will be robbed of its fertility, and will be left in a far worse condition than when the guano was first applied; at least, such have been my own results in its use, and such is the universal character of guano in Peru, as I have learned, upon personal inquiry, from the mouths of all persons (with whom I conversed) engaged in gardening and agricultural products around the city of Lima, the capital of Peru,

from whence we obtain the best guano. I have frequently been in Peru, first in 1835, again in 1842–3, and more recently in 1848, and on each and every occasion, I took the greatest pains to obtain all possible information as to the value of guano as a manure, and the mode of applying it to field and garden culture, as well as to its effects upon the land; and with one accord, and without a solitary exception, I was told that land stimulated by the use of guano soon became utterly worthless, unless the stimulus was kept up by repeated applications. This was the reason assigned for so little use made of guano, where the cost of the article is merely nominal, not exceeding more than half what we willingly pay for leached ashes in the District of Columbia. Of all the concentrated manures for sale in our sea-board cities, crushed bone or bone-dust is undoubtedly the best; its effect upon the soil is both prompt and permanent; at least, a single application made by me fifteen years ago, is still quite visible, although the ground has been heavily cropped ever since. I found that one bushel of crushed bone was equivalent to one double horse-cart load of good farm-yard manure. Forty such loads is the least that will enrich an acre of worn-out land sufficiently for a good crop of corn; hence, at the present price of bone-dust, that manure is beyond the means of most farmers for the renovation of poor lands.

Poudrette, of the Lodi (N. J.) Works, is an excellent manure for forcing vegetables to an early maturity; hence its great value to market-gardeners in the vicinity of cities; but, like guano, it imparts little or no abiding fertility to the soil.

Chappell's Fertilizer has opponents as well as friends. Its effect does not appear to have been uniform in the hands of different persons, nor even when applied by the same person at different times. Such discrepancy is not very marvellous, since we know of no human agency that can by any possibility produce precisely the same results in the product of the soil, every year, for a series of years. If this be true, and no practical farmer can gainsay it, ought the Fertilizer, any more than guano or other manures, all variable in their effects, be condemned and thrown out of use?

The cost of the Fertilizer ($1 per 100 pounds) is too high for farmers in general, 600 pounds per acre being necessary to bring very poor land up to a productive state. I am now in my third year's free use of this chemical preparation, with highly satisfactory results in every instance, the cost being the only objection so far with me. But even this is much reduced when the prolonged beneficial effect of this renovator is duly considered and compared with that of guano. The first two years I used the Fertilizer, (Chappell's,) I put two barrels or 600 pounds to the acre, without admixture; but, on account of expense, about a year ago I commenced a more economical use of it, by admixture with cheaper substances, obtained without money, such as rich earth, or fine manures sufficiently pulverized to be conveniently sowed by hand. For proportions see appendix.

Of the phosphates of lime, to be purchased in most of the large cities on the sea-board, I have only used Chappell's bi-phosphate of lime, 100 pounds of which, in common with other more bulky substances, to be sowed broadcast by hand, and harrowed in with small grain, or sowed in the drill, and dropped in the hill for corn and all sorts of roots, makes one of the best manures I have ever tried. See appendix.

Plaster of Paris, slaked lime, wood-ashes, and common salt, combined in due proportions, may, after all, at the same or less cost, be more profitable to the farmer than any manure yet known.

Considering lime as the only sure foundation to any good system of farm-

ing which may be adopted for the renovation of lands exhausted by injudicious culture, I will devote a few lines to that particular subject, by stating what I would do if I had my work to do over again, and which, of course, I recommend to all other beginners in their efforts to improve worn-out lands.

First, then, when your land has been well broken up for corn in the spring of the year, spread on it from thirty to sixty bushels of dry, slaked lime. If you are near enough to kilns to get the fine lime fresh drawn, and can get it on the land before it slakes, thirty bushels of that sort will be still better than the larger quantity slaked, but be very careful not to let your lime get wet before it is spread and harrowed in. If you are so remote from lime-kilns as to be able to haul only one load a day, it will be better to buy the fresh-burned and best lump-lime, because in that state it is much lighter, and when water-slaked, will increase from three to four-fold. Such lime ought to be put under cover, and slaked immediately with strong brine. Lime of the quality described, and treated accordingly, acts very promptly, mechanically as well as chemically; mechanically, in reducing stiff, rigid clay to a loose, friable texture; and chemically, by neutralizing acids unfriendly to vegetable production, and by combining with loose and light soils, they are rendered more adhesive and retentive of moisture; in other words, lime judiciously applied to stiff land renders it light, while it gives to lands too light a firmer or more compact texture. This dogma, paradoxical as it may appear to many, is fully established by every brick chimney or stone dwelling in the land. All who build such houses know that lime and sand, (the latter largely predominating in all light soils,) with water, are materials used by masons for the formation of mortar, which in a short time becomes as hard, if not harder, than the bricks. It is also well known that if stiff clay or rich mould were to be used with lime for mortar instead of sand, that when dry, it would moulder away and become impalpable dust. Now, with these plain truths before us, it is only necessary to apply smaller portions of lime to our lands, according to their texture, and we can have stiff or light land, as we may choose or will it.

Most writers on lime applied to agriculture, and many practical *liming* farmers, too, recommend doses of 50 or 100 per cent on the previous dressing until you get up to 120 bushels per acre, at the end of the eighth year. I have not done so, nor do I consider it absolutely necessary or always expedient at such short intervals. Better extend the time, according to my cycle of six shifts, applying the lime to your corn-land in any convenient quantity, not less, however, than you commenced with, say 30, 40, up to 60 bushels per acre. Finally and emphatically, be it remembered that if your land is naturally deficient in lime, that deficiency must, in some way or other, be supplied, or you never can reap the full benefit of manuring your crops; particularly wheat will be uncertain in quality, as well as in quantity, without lime, however rich your land may be, and in time of drought your crops of all descriptions may fail entirely; whereas, on judiciously limed land, similar crops, under like circumstances, will escape almost unscathed.

APPENDIX.

Combination of concentrated manures to be applied by hand:

No. 1.

Soap-boilers' ashes,	2 bushels,	To be sown per acre on all meadows, or other grass-lands, in late autumn or early spring.
Plaster of Paris,	1 "	
Common salt,	1 "	

The proportion of ashes may be increased to any available quantity, as high as ten or twelve bushels, which is as much as can be conveniently sowed by hand.

When ten bushels of ashes are used, this is a fine dressing to be harrowed in with any fall or spring crop, or as a top-dressing for winter-grain; and by reducing the salt to one fourth of a bushel, and adding one bushel of lime, if your land had been previously limed, and allowing the mass, after being thoroughly incorporated, to remain one or more weeks in the heap, you will have a fine compost for corn-hills; a small handful to be dropped with corn, potatoes, and the like.

No. 2.

Super or bi-phosphate of lime,	100 lbs.
Plaster of Paris,	60 "
Common salt,	15 "

Thoroughly incorporated with two, three, four, or five times their bulk of any light, rich earth, or scrapings of the lanes and farm-yard after the rough manure has been removed, forms another excellent dressing to be harrowed in with any kind of grain. A small handful dropped in corn or potato-hills, and for early spring dressing of meadows, broadcast, will be found in many cases equal to 200 pounds of Peruvian guano.*

No. 3.

Chappell's Fertilizer, 600 pounds per acre, sowed broad-cast, and harrowed or shovelled in, I have found equal for the first, and far better in succeeding crops, than 300 pounds of Peruvian guano.†

No. 4.

Chappell's Fertilizer, 300 lbs.
Peruvian guano, 50 to 100 " } Better than 600 pounds Peruvian guano, to be harrowed or shovelled in, but never ploughed in deep.

Composts to be spread from the cart:

No. 5.

Wood-ashes,	100 bushels.
Plaster of Paris,	10 "
Fresh slaked lime,	10 "
Common salt,	10 "

From five to twenty-five bushels per acre. But never to be ploughed in, and, except on grass-land, not less than ten bushels per acre ought to be used.

No. 6.

Rough compost is readily made on a large scale, by strewing the valleys in your wood-land, where is generally a large deposit of leaves and other vegetable matter, with lime at any season of the year, and at all convenient times after one good rain has fallen. Scrape into winrows, and when you are ready for forming compost, heap alternate layers of this vegetable mould with the rough gatherings about the farm-yard, and with a moderate sprinkling of each layer or so with common salt, or strong brine, and a bushel of gypsum for each acre to which the compost is to be applied. This makes a good and durable dressing to be harrowed in with small grain, or to be sown on wheat during the winter, and immediately after clover-seed has been sown.

* Up to 1839 I had depended almost entirely upon the resources of the farm for manuring. With the exception of lime and plaster, my use of foreign or purchased manures had been confined to experiments upon the smallest scale.

† For two years I have used Chappell's Fertilizer without admixture—generally two barrels or 600 lbs. per acre. Last autumn I sowed the poorest part of a fresh field with one barrel or 300 lbs. per acre, shovelled in with wheat. The product was equal to 23 bushels per acre, and much the best where the Fertilizer was used. The weight per bushel, to say nothing of the increased quantity, was 64 against 61.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

REMEDY FOR THE CURCULIO.

MESSRS. EDITORS: How this pleasant announcement always gladdens the heart of the genuine lover of good fruit! No matter how often old remedies have played him false, if the new one appears plausible, new hopes are inspired, and he sees, or seems to see, delicious ripe plums, apricots, nectarines, etc., bending down the thousands and tens of thousands of branches heretofore doomed to barrenness by this universal bore, curculio. He sees, too, the mouths of rich and poor, great and small, abundantly supplied with the rare luxuries of horticulture, instead of the vile sweetmeats and confections which ruin so many pearly teeth and robust constitutions; and his own mouth fairly waters, as he joyously contemplates this better time a-coming. So, the new remedy is applied with unabated confidence of success. But, alas! for "the best-laid schemes of mice and men." The season passes, and his *golden hopes* with it. His trees again cast their untimely fruit, and *sugar*-plums are still the predominating luxury. There was "a screw loose somewhere" *this* time also, but *where* neither he nor the *great remedian* ever discovers, nor ever will, so long as their experiments are based on the erroneous suppositions that the curculio hibernates in the earth beneath the trees, itinerates but little, and crawls from the earth to the fruit in the spring to deposit its eggs. As to its powers of locomotion, no bird or house-fly is much more active than the curculio when its wings are once unfurled; and that it is borne by autumnal winds to a southern climate, and returned by the southern breezes of spring, appears less inconsistent to me than the prevailing notion that it spends some eight or ten months soaking and drying, freezing and thawing, in our northern earth, and then comes out bright in the spring. It was once as seriously believed that swallows dive into the beds of rivers at the approach of winter, and hibernate in the mud.

If curculio arise from a state of hibernation in the earth every spring, it might seem an easy thing, by spreading broad coverings, or other means, to detect some of them in doing so. I have tried it, and will give half my peach-crop, at least this year, to any one who will prove the catching of a curculio under these circumstances.

It is now June 17, and eggs which were deposited in plums the last of May are grown to grubs about one sixth of an inch in length. These larvæ having absorbed the life of the plum, it falls to the ground, where they enter some two or three inches, or less, change in about three weeks to curculio, and return to upper air—whether to deposit eggs the present season, or how to dispose of themselves the many months between now and winter, and especially *then*, is *the question*. Does *this second generation* lay eggs in other substance than fruit, which endure the winter and hatch out in the ensuing spring?

Place a dozen plums, more or less, as they fall from the tree, on a spot of light soil, and keep them covered securely some three weeks; you will find as many curculio, with a delicacy of structure hardly fitted for the hardships of an *earthy* hibernation. If you now continue the experiment, and cover them with dirt as solid as that through which they are supposed to work their way *up* in the spring, they die; or if you feed them with fruit, they will eat and do well till about October or November, and then die without reëntering

the ground. Whoever will put an inch or two of moist sand into a tumbler or glass vase, and fill it with fruit containing the larvæ of these insects, may observe them through the whole of their wonderful process of transformation, and gain new ideas, more satisfactory and grateful to the taste of the true lover of nature, than even the most delicious "golden drops."

We err, most of all, in jumping at conclusions. Mr. Todd, for instance, covered the ground beneath one of his trees with hard-trodden dirt, which he thinks "delayed the resurrection of the curculio," and saved his plums. He therefore concludes "that the curculio itinerates but little, that it hibernates in the soil, under the branches of the trees on which it has flourished the preceding summer," etc. Now it unluckily happens that fruit-trees are as numerously visited by curculio the *first* year of their bearing, as they are any subsequent year, to say nothing of the fact that this insect can endure but a very short existence in the earth. I came to a similar conclusion as Mr. T. nearly ten years ago, by seeing the parts of a tree which leaned over a stream of water, weighed down with ripe plums, while every other branch was entirely barren. Subsequent observation and experiment have proved to my satisfaction, that these insects are guided by instinct to deposit their eggs where their larvæ may, by the laws of gravitation, reach such quality of earth as will favor their transformation. Hence it is, that intervening obstacles, as boards, pavements, hard-trodden earth, hogs, hens, chickens, etc., do a partial, temporary service; the curculio, seeing them beneath the tree, shuns it for one of *clearer prospect.*

There seems to be of late a fearful increase of insects noxious to the great interests of agriculture, caused by the wicked, wanton destruction of those natural guardians, insectivorous birds, which is so strangely, blindly allowed to exist almost everywhere about us. These truest friends of the farmer would fill his forests, fields, orchards, and gardens, and sport familiarly about his doors and windows, and afford ample protection to the productions of his soil, but for the reckless idlers who, in shape of worthless dogs, cats, and self-styled sportsmen, seem incapable of bearing the sight or sound of a quiet, harmless bird.

Crows, hawks, owls, black-birds, foxes, skunks, and weasels, naturally destroy a vast amount of noxious vermin-life, by nipping it in the bud, by seizing upon it at the starting-point, in early spring, as it comes out from a state of hibernation, and should be protected. Skunks, owls, etc., are especially valuable for clearing the farmer's grounds of those nocturnal insects which cut off his choicest productions while he regains his strength in sleep. It is a penny-wise and pound-foolish policy which weighs the occasional loss of an egg, chicken, or hill of corn, against the great amount of good which these natural guardians are ever doing. E. SANBORN.

Andover, Mass., June 17, 1854.

NEW KIND OF BOOTS AND SHOES.—Measures have been taken to secure a patent for a new kind of boots and shoes, invented by Albert L. Murdock, of Boston. The soles, and the lower portions of boots and shoes, are made of India rubber, or gutta percha, while the upper portion are formed of some textile fabric, such as woollen, cotton, etc. The lower portions of the boots and shoes protect the bottoms and sides of the feet from wet or moisture, while the upper portions form an elastic covering for the upper part of the feet or legs, and keep the lower portions properly adjusted to the feet, and at the same time allow the free perspiration to pass off.

THE PEAR BLIGHT.

BY A. H. ERNST, CINCINNATI, OHIO.

THE following paper was communicated by Mr. Ernst to the Cincinnati Horticultural Society, and subsequently appeared in the *Horticultural Review:*

The cultivation of the pear tree is very simple; it readily adapts itself to any soil or location, so that it be not a swamp or marsh. A deep, rich, clayey loam, with a porous subsoil, and a full exposure to light and air, is the best for its full development. The tendency of the tree is to throw down strong tap-roots; it is, therefore, important to know something of the nourishment it will find to feed on there. This tendency is overcome by growing it on the quince, the natural disposition of which is to spread its roots, and luxuriate on the surface soil; though the tree is dwarfed, and the duration of its life shortened, still it is better for shallow soils, and gardens where not much room can be afforded. The fine sorts, with few exceptions, succeed well, and produce abundantly on the quince. These are usually trained in pyramid form, branching from the ground up, making a very handsome and attractive object in the border. When grafted or budded on their own stocks, they require more room, and are usually longer coming into bearing.

The cultivation of the tree has, however, its drawbacks. It is not hardy; or, if you do not like the term, it is subject to be cut off and destroyed by death at any time; when seeming in full vigor of health and growth. On the cause, there has been much speculation, without seeming to come to any satisfactory conclusion.

Long experience, observation, and much reflection, have established in my own mind the cause. I do not know that I can make this clear or satisfactory to you, and other minds, but I may open a door to a new, or rather an unexplored field for thought and reflection, both to the practical and the scientific investigator. Perhaps there is no spot in this, or any other country, where a greater opportunity has been afforded for an observance of the diseases to which the pear tree is subject—especially that form which we understand as *fire blight*—than here.

Scientific gentlemen, with some exceptions, have generally followed each other in attributing it mainly to INSECTS, and some to an *exhaustion*, or *absorption* of those *particles* from the *soil*, which are *essential* to the *health* and *life* of the *tree*, and the *perfect development* of its *fruit*, admitting, at the same time, the existence of other extraordinary causes for its disease and death.

Without denying that insects are sometimes injurious to the pear tree, even to its destruction, I must be permitted to question the general correctness of the theory, and also that of an exhausted soil. To my mind, facts do not warrant such conclusions as applicable to our region. To make out the latter theory, it should not be left to rest on doubtful speculation, but it should be shown to harmonize with matters of practical fact, as they continually occur. The ingenuous mind never should allow itself to lose sight of these.

Though, unquestionably, the working, or grafting on bad stocks, such as *suckers*, and planting in *bad soil*, will facilitate the destruction of the pear tree—as the same cause would any other—they are only *local*, and *lay* not at the *root* of the *evil*. To suppose the adventitious existence of some sub-

stance in the soil, to remove difficulties out of the way of a favorite theory, is not satisfactory.

It has been advanced that the cracking of the *White Doyenne* is owing to an exhaustion from the soil of those particles necessary to its perfect development; that the tree would resume its former habit of the production of perfect fruit, if these substances were supplied to the roots. Among many reasons for dissenting from this position, let me say, that for eight or ten years, I have hardly had a perfect fruit on trees of this variety, many of which formerly bore fine fruit until last summer, when, on all of them, it was as fine as I ever saw it anywhere; and this without any application whatever to their roots. The trees are scattered over my grounds; some in grass, the sod of which has not been disturbed for years. I attributed this remarkable effect to atmospheric influences, with which the composition of the soil had nothing to do. It was, during the growth of the fruit, unusually dry for our climate.

Let us now examine the analysis of the pear tree, as a correct and reliable basis to overcome the malady to which the tree is subject. Loudon, and other eminent writers on the subject, would have us to understand that there is a strong analogy in the life principle of plants and animals. It is, therefore, fairly inferable that, as animals of the same species do not wholly depend on one class of food for life and health, but that, to a certain extent, choice is left to select from, producing the same results, that this is equally applicable to plants. When we, therefore, have the analysis of Prof. Emmons before us, showing that the ash of the sap-wood of the pear tree contains more than twenty-seven per cent of phosphate of lime, twenty-two of potash, and a number of other inorganic elements, though perfectly correct, are we sure that a tree grown in a different soil will not produce different results? I shall show that this is the case in other species of trees, and therefore infer it is so with the pear. It is very certain that the color of fruits is affected by substances in the soil and taken up by the roots, not essential or detrimental to the health of the tree.

Liebig, in speaking of the inorganic constituents of plants, says: "Many of the inorganic constituents vary according to the soil in which the plant grows," etc. Again: "Most plants—perhaps all of them—contain organic acids of very different composition and properties, all of which are in combination with bases, such as potash, soda, lime, or magnesia," etc.; and after proceeding to show that certain acids are always, of necessity, present in plants, he proceeds: "It is equally certain that some alkaline base is also indispensable in order to enter into combination with the acids." And, while he seems to make it clear that the life and health of the plant depend invariably on certain acids, he says: "It will be necessary to bear in mind that any one of the alkaline bases may be substituted for another, the action of all being the same." His object is, if I understand him, to prove that certain acids are, in the first place, essential to the existence of the plant, and that this always attracts a given quantity of alkaline; that these alkalines are not necessarily the same, but similar in action; that the plant will take them up as they are found in the soil. To prove this, he says: "It has been distinctly shown, by the analysis of De Saussure and Berthier, that the nature of a soil exercises a decided influence on the quantity of the different metallic oxydes contained in the plants which grew on it; that magnesia, for example, was contained in the ash of a pine tree grown at Mont Brever, while it was absent from the ash of a tree of the same species from Mont La Salle; and that the proportions of lime and potash were also very different." Again

he adds: "Let us now compare Berthier's analysis of the ash of two fir trees, one of which grew in Norway, and the other in Allerard, (departemen de l'Isere.) One contained fifty, the other twenty-five per cent. of soluble salts. A greater difference in the proportion of the alkaline bases could scarcely exist between two totally different plants."

Though it seems in all cases the oxygen was found nearly in the same quantities in each species, proving conclusively that while certain properties, such as some of the acids and oxygen, are always present in nearly uniform proportions, that it is not so with other substances; that they not only vary largely in quantity, but in some instances are altogether absent; that a tree, like an animal, has some latitude of choice in its food; and that the elements of the air are essential to the existence of both. This is perfectly in harmony with every day's experience of the different and diverse soils we find the tree to grow and flourish in. It may be questioned, if a tree, which finds the proper constituent particles in a soil for its healthy growth, can ever exhaust any part of it to such an extent as to produce death, if the natural sources of growth continue to yield their supply from the atmosphere. A forest does not wear out the soil and die; on the contrary, we are indebted to its agency for the virgin soil we find under its boughs. It is the opinion of writers of high authority, that among our modern forest trees, there are some which have attained the great age of four thousand years; and it is said that "investigation of coal and lignite strata has proved the existence of trees of the same order as those now existing." If this be true, it proves positively that trees do not draw on the soil, so as to destroy themselves, or to impair the perfect development of their seed and fruit. But it may be said this is applicable to a state of nature. Well, this is just what I am endeavoring to show; that we have run contrary to this; and, from that cause, have produced an enfeebled race, which we are exposing to an uncongenial climate, and charging it (improperly, as I think) to the soil.

The reason why soils are worn out, is because of injudicious cultivation, a continued removal of its products without a proper restoration of the properties thus removed. This is not applicable to trees, only so far as the removal of fruit is concerned, and the obstruction of the natural supply from decayed leaves, branches, etc. This may be larger or smaller, and of course it is wise to see that the soil is well supplied with all the particles thus drawn from it. You may, however, feed the pear tree as much as you please, and still it will die in the midst of a luxuriant growth; and it is, therefore, to other causes that we must look for its destruction, not to the want of proper food.

The advocates of the insect theory have not been very successful in proving its truth. They are bound to show something more plausible for its support than the simple fact that insects are found in connection with the diseased parts. They are bound to show that these insects are really the cause, and not there as a result of the blight. And, moreover, to show some reason why it is that they *discriminate*, pass by certain unmolested pear trees, and do not make a clean sweep of all within their reach; and also, why it is that their destructive influence is sometimes suspended for years together.

Prof. Harris' description of the *Scolytus pyri*, in his invaluable work on Insects, which is mainly relied on as the support of this theory, fully defines its regular periods of change and operations. I am very sure that it will not apply to our blight, all the reasons for which I can not here enumerate. Suffice it to say, that the injury of that insect "*ends* with the death of the *branch* down to a certain *point*, but does not extend below the seat of attack, and does not affect the health of other parts of the tree." (Second edition *Har-*

ris' Treatise on Insects.) A comparatively harmless insect, whose effects all cultivators in this region will have observed on their trees.

I will here very briefly give what I deem the cause and the reason for the blight, which are not materially different from those given elsewhere. Long observation has confirmed my judgment that the disease is chargeable mainly to atmospheric influences. The Great Creator has in his wisdom so ordered it, that the vegetation, soil, and climate of every part of the globe act in perfect harmony for the best development of the former. A departure from this state of nature is at the hazard of the health and longevity of the plant or tree, though this result does not invariably follow. The pear tree, as before observed, is not a native of this continent, but of a different hemisphere, where it grows to large size and great age, as other forest trees do. All intelligent writers, so far as I know, are agreed that the improvement of the fruit has generally been at the expense of the hardiness and durability of the tree, (not a necessary consequence.) However, we find it so. We have imported an enfeebled race, and are exposing it to a new climate, the vicissitudes of which it is not fully capable of resisting. I care not for terms: whether you call it *frozen sap blight*, or *sun blight;* whether the effect is produced by sudden and rapid changes of winter temperature, or an excessive summer sun. In either case, it is the destruction of the natural functions of the tree, producing disease and death. The former is often tardy in its work, but the latter generally rapid and instantaneous. In the one case, it is brought to bear on the tree in a state of rest, when the sap-vessels are contracted, when their juices have been expended to form wood, which is immaturely ripened. In the other case, when the sap-vessels are extended to their utmost capacity, to supply the demands of a rapid and luxuriant growth; when this growth is in its most tender and delicate condition, the scorching mid-day sun does the mischief; the sap, by its rays, is scalded and vitiated, a chemical process of decomposition takes place, its poison is soon carried to and mixed with other portions of the tree, and the whole is often irretrievably lost in a few hours. The only remedy is, the moment that it is discovered on the limb, where this form of blight always makes its appearance, to lop off until you come to the sound and healthy wood, and thus prevent its spreading. Do not stop to hunt insects until you have performed this work, when you can do so leisurely.

Sun blight, or *fire blight*, is always most prevalent in a wet and hot summer. There has been but little the last three years, and we shall certainly have no frozen sap blight to complain of next summer. This is to be attributed to rather unusual dry summers during this period; the wood having ripened well before winter set in, and the growth not so luxuriant as in wet seasons.

As a remedy, or rather a preventive to the frozen sap blight, I would suggest the shortening-in application, in September or October, to check the growth, and induce the maturing of the wood. This system is, perhaps, only applicable to dwarfs, as standards can not well be reached. What is understood by shortening-in, is to cut back the present year's new shoots to the firm wood, say one third, or one half of it, as the case may require, so that the sap remaining shall be expended in perfecting the wood which is left, and not to be stimulated by the leaves on the ends of the shoots to continue growth. This system is also practised to force the tree into forming fruit-spurs, and thus facilitate the production of fruit. Care must be observed in the time of performing this operation. It must not be so early in the season as to cause the bursting of the lateral buds, and thereby cause a more inju-

rious growth than it is attempted to check. There need be very little risk in this; we must be governed by the state of the season. It is better a little late than too early; when the majority of the leaves on the shoot are rigid and hard, is a suitable indication of the proper time.

Having said so much about the want of hardiness of the tree, it may be asked, how I account for the trees that are to be found up and down our land, which have withstood the winter's storms and summer's heat from one to two hundred years? Before I answer the question, allow me to offer them as standing monuments against the exhaustion and insect theories. We have had some specimens in this vicinity—until the spirit of city improvements required their room, when the rude hand of the woodman brought them low—whose existence was coëqual with the first impress of civilization; they remained sound, healthy, and fruitful to the last. Such specimens, it will be found, have all originated from seed, and always from a hardier stock than the varieties of more modern introduction. A friend has just given me the history of one in Guilford, Conn., which he says is over two hundred years old, measuring fifteen feet in circumference at five or six feet from the ground. It is now beginning to decay, but yields a considerable quantity of fruit. He says the fruit does not compare with the best now in cultivation, but when he was a boy, more than fifty years ago, it was considered very superior.

It is to these hardy remains of ancient days we must look for constitutions to hybridize with our finer sorts, say, if you please, the *Seckel*, which is as hardy as any of them, for a class of trees producing superior fruit, and, at the same time, such as we can trust out of doors.

I fear the above remarks may seem lengthy to some, but the subject is of too much interest to be passed over lightly, or with mere assertions. As it is investigated, the more fully its importance is brought to view. I have endeavored to avoid all improper allusions, unnecessary repetitions, and aim at display, simply confining myself to a plain statement of theories and opinions of others, their comparisons and plausibilities. Much might be added to sustain the views I have presented as the real cause of destruction of our pear trees.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

PRESERVATION OF WHEAT IN TENNESSEE.

Messrs. Editors: I am aware that very many of my farming friends in Tennessee are the readers of your valuable publication, and are heavy wheat-growers, and now that recent railroad conveyance, with the foreign demand, has permanently settled upon this valuable grain a fair price here, it is not at all unlikely that much more attention will be paid to the growing of wheat in future. A few otherwise systematic and economical farmers in Tennessee raise a pretty fair crop of wheat, and have no barns to house it in. This is a very great desideratum to a wheat-grower, and the want of good barns, with some other proximate causes of mismanagement, sometimes results in material damage to the wheat of these farmers before it reaches the miller's hopper. Therefore, through you, to my farming friends in Tennessee, let me, without ostentation, give my experience in harvesting and saving a wheat crop, referring, at the same time, to my acquaintances for the character of my wheat crops:

Whenever the straw of the wheat becomes of a golden yellow, for about two inches below the ear or head, disregarding any other feature in the straw or grain, I cut it down, bind it right up after the scythe, in small binds, shock likewise in small shocks. I let it stand thus in the field till it cures and dries perfectly, so that the grain would grind, and *no longer*. I haul to the barn thresh out when convenient, unless I notice a sign of weevil breeding in the wheat, when I thresh at once; and having a large bin for the purpose in the barn, I crib it up in the chaff till it is needed. In this way I have saved and do save one thousand bushels of wheat clear from mould, heat, or must The bran is always thin and tough, the flour white and sweet, preserving its native fermenting qualities to the satisfaction of the most fastidious epicure in any clime. This process is easy, simple, and safe, and it may be that most of my brother farmers knew before what I have here told them was my way, and the proper way; but do they, to the letter, pursue it? That is the question; but the whole science of philosophy, according to *Epictetus* (a famous stoic philosopher, highly esteemed in his day,) consists in two words, *bear* and *forbear;* to the latter your humble correspondent now will adhere.

As ever yours, A. L. B.

Mill Bend, Tenn., June, 1854.

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

PLANTING IN MISSISSIPPI.

Messrs. Editors: Having sowed our oats, our attention is called to clearing land if necessary, or our branches, if they have been neglected in the summer, which is the right time for this work. When this work is done while the growth is not in foliage, there is much less difficulty in burning off. Beside, a great many more stumps die. Willows, which are a great nuisance in creeks, in most cases, after being cut down, will put out. The most successful plan which I have tried, in securing their destruction, is, whenever they shoot out suckers, to break them out immediately, which can be easily done when taken in time. But, if allowed to grow five or six months, they have to be broken out by the pole of an axe, and not cut down. By repeating this process a couple of years, I can destroy most of them. The old logs on land that has been idle two or three years, are about this time cut up, turned by oxen, rolled and burnt, if the weather admits. We bed up this kind of land in January, expecting to have some freezes that will mellow it. Having finished clearing new ground and branches, we have all our logs to dispose of as soon as we can, using the small branches, etc., to assist in consuming them. Our cotton-stalks, if small, we beat down; if large, we pull up and burn. Having made ready a considerable portion of our land intended for cotton, if we have suitable weather we now burn off new ground or branches. But when this work has been done in the winter, we delay as long as possible, that the wood may in some degree season. By the 1st of February, we endeavor to get to steady ploughing. Our fallow-land calls on us for double ploughs, and land that is bedded out must be cut to pieces by a sword-harrow just before planting. Our other cotton-land is two-furrowed by a single horse-plough, except we wish to change our rows, then it is three-furrowed. When there are two furrows, they are made to meet in the water-furrow.

Considerable difference of opinion exists as to the advantages of a centre-furrow for cotton. It is maintained, that by a centre-furrow the tap-root is enabled to penetrate deeper—that by it, in a dry year, the plant can resist drought better, and that by exposing the soil beneath, where the cotton is to grow, the atmosphere can act on it, producing very important changes. On the other hand, it is contended that the tap-root must reach the hard ground before the plant will do much toward maturity, that the deep furrow delays this period, and that, in a wet season, it invites too much moisture beneath the plant. Good planters advocate both systems, appearing to succeed equally in making good crops by either plan. My practice is, to avail myself of both, as it may suit my convenience. I think agricultural writers are two indiscriminate in advocating deep ploughing. The depth of the ploughing should be governed by the condition of the soil. Ploughing eight or ten inches in a soil ten inches deep, would of course be attended with great advantage; whilst the same ploughing in one of four inches might prove an absolute disadvantage. The reason is obvious. In the latter, we are mixing four inches or more of clay with the same amount of soil, which, in the given space, presents only half of the fertilizing elements, and of course forces the fibrous roots to travel twice the distance for the same amount of nourishment. But if we turn up four inches, and sub-soil six, then we are offering materials in their concentrated form, at the same time we are placing our corn over a mellow mass, to absorb moisture when in excess, and to give it out to the plant in a dry time. To preserve our lands in good condition, we are compelled to level or circle them, and to further protect them by hill-side ditches. Those wishing information on this subject would do well to give an article, by a Planter, in the April number of *The Plough, the Loom, and the Anvil*, of the present year, an attentive perusal. The system described there is excellent for land which has few stumps and washes. But I would advise bringing them as near a level as possible, having the ditches determined by the ground. Having two-furrowed our cotton-land, our attention is next called to our corn. Here there is considerable difference in the mode of preparation. Some run a deep centre-furrow with a bull-tongue plough, to be bedded on by a two-horse plough. The objection to this course is, there is great danger of placing the corn too high for the last working. Others tap two furrows, as for cotton, break out, and when ready to plant, throw back four furrows. This obviates the objection to the first mode, but it has a difficulty. In planting, the land is brought too near a level, and should we have some of those washing rains, that in the spring are frequent, the water sweeps across the rows, bearing off the soil, and filling up the hill-side ditches, unless they have great descent. The plan I have adopted appears the least objectionable. I use a large 14-inch scooter or bull-tongue, attach two horses to it, and run three furrows as deep as I can in the water-furrow of the old row. A week before planting, I commence throwing out the balance of the row, which is a species of sub-soiling. My corn is not placed too high, and I have fresh land to plant with.

I must close, for fear you will think I am appropriating too much of your journal to my use. Yours, etc., H. W. Stackhouse.

Hinds Co., Miss., July 1, 1854.

Sponge-fishing is said to have become a very profitable business in the neighborhood of Key-West. One hundred thousand pounds are reported to have been gathered during last year, and the sales amounted to $25,000. The article is mostly procured by natives of the Bahamas.

GREAT MECHANICAL FEAT

We received an invitation a few days since, to attend a collation, to be served up in a gigantic iron-casting at the establishment of Messrs. Mott & Ayres, on the North River, foot of Twenty-sixth street.

We accordingly took stage, and on arriving at the office of the gentlemanly artists, found quite a number of the craft assembled, and at the time appointed we were taken through the work-shops, and, by request, descended a ladder into a huge CAST-IRON GAS-METRE! The metre, one half of it, was standing on its end, inclosing us, of course, on all sides, by a circular iron wall. A table was appropriately spread with plates and viands for forty people. About thirty were present, at the first table, though the whole number (40) were afterward accommodated at a second dinner.

The dimensions of this, "the largest casting ever made," are as follows:

Internal diameter, - - - - - -	15 feet.
Depth, - - - - - - - -	6 ft. 3 in.
Average weight of each casting, - - -	16,000 lbs.
Thickness of casting, ONLY ONE INCH.	

Four such cylinders were cast in succession, without the loss of a single heat; and these four castings, when united together, form a complete metre.

This is said to be the largest casting ever made in any country. But the chief wonder is that castings of that large size, *so very thin*, could be made, without loss of one or more trials. Had the thickness been several inches, imperfections might exist and still be invisible, being covered. But with so thin a plate, any unequal cooling of the metal would most certainly spoil the work.

This casting is designed for a stationary metre for the Manhattan Gas-Light Company, and is to be placed near Fourteenth street, on the East River. It is designed for the purpose of measuring the gas which passes out of the gasometer. The quantity manufactured may thus be compared with the quantities indicated by the totals of the several metres where the gas is delivered, and losses by leakage or otherwise may be determined. These losses, we understand, are believed to amount to 20 or 25 per cent.

This is not the first feat of this kind accomplished by this enterprising firm. In 1851, at the order of the same Gas Company, they cast twelve pillars, each 50 feet 8 inches in length, 3 feet diameter at base, and 2½ feet diameter at top, with an average weight of 27,250 lbs. each, and the whole work was accomplished without the loss of a single casting.

These pillars, it is stated, are 10 feet 8 inches longer than any pillars ever cast in Europe. They are to be seen around the huge gasometer of the Gas Company, on the Tenth avenue.

Girders of open-work, twelve in number, and each 40 feet long, and weighing 10,000 lbs. each, were also cast at the same time, as supports or bands to hold the pillars and other frame-work in their places.

The guests were exceedingly gratified at this proof of skill in the operatives, and of enterprise and efficiency in the gentlemen of the firm.

It will not be inappropriate to annex to this statement a paragraph which we find "in the papers," as follows:

"A NOVEL DINING-ROOM.—The *New-York Commercial* gives an account of a dinner-party given by Messrs. Stillman & Allen, Iron-Workers, New-

York, in the cylinder recently cast for the "Metropolis," the new steamer in process of building for the Fall-River line. Twenty-two persons sat down to dinner in the tube, and after dinner the guests were amused with a drive in a buggy through their dining-room. It was found that more than one hundred persons could stand in the cylinder. It is nearly nine feet in diameter, and has twelve feet stroke of piston. It is the largest, by more than one third, ever cast in this country; and it is said that its immense size will give great power with steam of low pressure, thereby promoting the safety and durability of the engine and boilers, and economy in producing an equal amount of power with less consumption of coal."

It should be noticed, in justice to all parties, that in the casting at the Novelty Works, the guests were seated lengthwise of the cylinder. In that which we have first described, the cylinder stood endwise.

Each one of these firms is an honor to the country. What they can not accomplish, may perhaps be set down as an actual and essential impossibility.

HOW STATUES ARE MADE.

The following letter, in the *Literary World*, from George H. Calvert, describes the *process of sculpture*, and contains information that will undoubtedly be highly interesting to a large portion of our readers. It contains also some most admirable remarks upon the "*Greek Slave*," by Powers, which still further commend it to notice:

"Process of Sculpture.—*The Greek Slave.*—This statue having, on its first presentation to the American public, excited unbounded admiration and enthusiasm, a brief account of it will be interesting to its author's fellow-countrymen.

The Greek Slave is the second ideal work of the American sculptor, Hiram Powers—the Eve being his first. The clay model was begun and finished in the summer and autumn of 1842. American sculptors having been hitherto obliged to work abroad, but few of our citizens have had opportunities of witnessing the labors of the studio; acceptable, therefore, will be some explanation of the several processes through which a work in sculpture must pass, ere the artist can present his conception smoothly embodied in marble. The visitors to the 'Slave' will thus be made acquainted with the bodily birth and growth of the wonderful creation that stands before them in dazzling beauty.

The conception being matured in the artist's mind, the first step in the process of giving form to it, is to erect, on a firm pedestal, a skeleton of iron, whose height, breadth, and limbs are determined by the size and shape of the proposed statue. In this case it would be above five feet high, with branches, first at the shoulders, running down forward for the arms, then at the hips, to support the large mass of clay in the trunk, and thence divided in two for the legs. About this strong simple frame is now roughly built, with wet clay, the pre-determined image. Rapidly is this moulded into an approximation to the human form; and when the trunk, head, and limbs have been definitely shaped, then begins the close labor of the mind. The living models are summoned, and by their aid the surface is wrought to its last stage of finish. I say models, for to achieve adequately a high ideal, several are needed. Na-

ture rarely centres in one individual all her gifts of corporeal beauty. For the Eve, Powers had more than a score of models. The modern Christian artist can not be favored as was the painter Zeuxis of old, to whom a Grecian city that had ordered from him a picture of Helen, sent a number of its choicest maidens, that out of their various graces and beauties he might, as it were, extract one matchless form. For the 'Slave,' the character Powers had established in Florence for purity and uprightness, obtained for him one model (who is not a professional sitter) of such perfection of form as to furnish all he could derive from a model. With this breathing figure before him, and through his precise knowledge of the form and expression of every part of the human body, obtained from the study of nature and his own deep artistic intuitions, the clay under his hand gradually grew into life, as it assumed the elastic, vital look, which no mere anatomical knowledge or craft can give, by which is imparted, by the genial sympathy with nature's living forms in alliance with a warm sensibility to the beautiful, qualities which crown and render effectual the other less elevated endowments for art. Thus, by the most minute manual labor, directed by those high and refined mental gifts, the clay model of the 'Slave' was wrought out; and here the artist's work ended; the creation was complete. The processes whereby it was now to be transferred to marble, though of a delicate, difficult kind, and requiring labor and time, are purely mechanical, and are performed, under the artist's direction, by uninspired hands.

In order that the soft clay image be transformed into a harder substance without suffering the slightest change in its surface, a mould is applied to it, in the same way and with the same material as when a cast is taken of the living face or head, by means of semi-liquid plaster of Paris. The clay figure is entirely covered with this substance from one to two or more inches thick, provision being made for taking off the arms and for splitting the trunk after the plaster shall have hardened. The clay is then all taken out, the hollow mould is cleaned, and then refilled with semi-liquid plaster of Paris. When this, which now occupies entirely and minutely the place of the clay, has in its turn become hardened, the outside crust of plaster is broken from it, and then is laid bare an exact fac simile of the original clay figure in hard, smooth plaster of Paris, capable of bearing the usage of the studio, and of receiving the many marks that are to guide the marble-cutters, whose work now begins.

First comes the blocker-out, with his heavy mallet and coarse chisel, under whose rough blows the white block soon begins to grow into a rude likeness of humanity. Then a finer workman, who loosens more of the folds that overlay the beaming image that the artist is bent on disclosing from the centre of the marble. And, finally, the artist himself, or, as in this case, a refined worker, schooled under the eye of Powers, gives the finishing touches, reproducing, with unsurpassed accuracy, in the transparent, pure marble, every swell and indentation, and minutest curve, all the countless delicacies of detail, the which, combined with and forming grand sweeping lines, characterize the original as moulded in clay by the hand of Powers.

And now, in the midst of us, here is the marvellous work, drawing from our hearts a flood of vivifying, purifying emotion; a revelation made by its author to his countrymen of the power and majesty of art. They who have looked in silent delight on the Venus of the tribune in Florence, no longer enjoy a unique privilege. On our native shore, sprung from the warm bosom of native strength, a fresh emanation from the exhaustless soul of beauty, stands a work as resplendent with the impress of genius as the famed Grecian goddess, as sublimely simple, as vividly graceful, and more

touching in its moral appeal. The stronger the genius the simpler the elements wherewith it delights to work. How simple, how common are those by which such overpowering efforts are wrought: a young maiden in a condition of painful constraint. But the two great sources of human interest—the human body, and, shining through it, the human soul—are here. The artist had the creative vigor to reproduce, in its indescribable symmetry, its matchless grace, its infinite beauty, that chief marble of the earth, the human body, making transparent through these attributes deep inward power and emotion; and it is because he has had this inspired mastery, that, standing before his work, the beholder is not only spell-bound with beauty, but awed by a solemn, ineffable feeling, and mysteriously drawn closer into the chastening presence of God."

AMOSKEAG MACHINE-SHOP.

The machine-shop of the Amoskeag Company, unpretending in appearance, and entirely out of sight of all passers-by, has ever been an establishment of importance, using immense quantities of raw material, turning off a great amount of machinery, and giving employment to a large number of workmen: and now, under the judicious management of O. W. Bailey, Esq., its agent, it has not only become a most important part of the Amoskeag Company's establishment, but has gained a world-wide reputation for the excellence of its machinery.

The first machine-shop, known as the Old Machine-Shop, was built in 1840, upon a section of the lower canal, which canal, since completed, is a continuation of the famous Blodget Canal, into which the water of the upper canal passes, and from which the water is discharged into the Merrimac, through a weir, of permanent stone-masonry, below Granite street, a distance of 7250 feet, from whence the water enters the canal from the basin. This shop is 260 feet in length, 36 feet in width, and three stories high. In 1842, the company erected an extensive foundry, before this having obtained their castings at Chelmsford. This shop answered all the purposes of the company until 1848, when they built another machine-shop and foundry, now known as the New Machine-Shop and New Foundry. This machine-shop is 260 feet in length, 40 feet in width, and three stories in height; and the foundry is 120 feet in length, 80 feet in width, and one story in height. At this time, the company commenced the manufacture of locomotives, and the experiment succeeding beyond expectation, they have from time to time extended their works; adding a boiler-shop in 1852, 200 feet in length and 40 feet in width; a tank-shop, 200 feet in length and 25 feet in width; a forge-shop, 200 feet in length and 36 feet in width; a paint-shop, 84 feet in length and 40 feet in width—all one story in height; a fire-proof pattern-house, 100 feet in length, 30 feet in width, and three stories in height; and a store-house and setting-up-shop, 250 feet in length, 40 feet in width, a part two stories in height, and a part one story in height.

The first locomotive, the Etna, was built in 1849, for the Northern Road, since which time the business has so increased, that they now build sixty a year, turning out more than one a week.

THE INVENTOR OF RAILROADS.

We hear the question asked, who was the inventor of the railway? and have never heard it satisfactorily answered; and we believe there are very few persons in this country who know any thing on the subject. Some few years ago, Howitt, of the *People's Journal*, gave a somewhat lengthy sketch of the alleged inventor, who, up to May, 1836, had been neglected in England. While thousands had been enriched by his brilliant scheme, he had remained forgotten—forced by poverty to sell glass on commission for a living. How many of the railway projectors, agitators, stockholders, etc., have heard of the subject of these remarks?

"About half a century ago—the exact year is not known—there was born in Leeds, Eng., a man named Thomas Gray. Scarcely any thing is known of his early history. He was, we believe, a poor collier; and being very ingenious, he conceived the idea of facilitating the transportation of coal from the middle-town colliery of Leeds, a distance of three miles, by means of a sort of railway which he constructed of wood. Upon this his cars moved at the rate of three and a half miles an hour, to the great merriment of a wise and discriminating public, who laughed at the idea of a railway as something very visionary, and as the mere suggestion of laziness. Poor Gray thought otherwise. Magnificent visions of future railways, such as are now stupendous realities, loomed up before him, and he began to talk in public of a general system of iron railroads. He was, of course, laughed at, and declared a visionary, moon-struck fool. But the more Gray contemplated his little railway for coal, the more firmly did he believe in the practicability and immense usefulness of his scheme. He saw in it all that is now realized, and he resolved, in spite of the ridicule, the sneers, and rebuffs that were heaped upon him, to prosecute his undertaking. He petitioned the British Parliament, and sought interviews with all the great men of the kingdom; but all this had no effect except to bring down upon him, wherever he went, the loud sneers and ridicule of all classes. Still he persevered, and at length engaged the attention of men of intelligence and influence, who finally embraced his views, urged his plans, and the result is now before the world. Thomas Gray, the inventor of railroads, who, no longer ago than 1820, was laughed at for ever mentioning the idea, still lives in Exeter, England, in the full realization of his grand and noble railroad schemes, for which he was declared insane. How much has the world been benefited by his insanity!"

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

SECURITY ON RAILROADS.

Messrs. Editors: In the June number of *The Plough, the Loom, and the Anvil*, I noticed a brief statement of an invention for the purpose of guarding against accidents to railroad trains. It is in some respects similar to one which I discovered some months since, except that I do not use the battery or electricity in any way. My invention is arranged and operated by the locomotive upon mechanical principles. Having applied for a patent on the same, I will send you a brief statement thereof:

A medium of fine twisted wire, or any other suitable material, is placed along the track, under ground, having a toothed-wheel attached, which is divided into two to four sections. The road is to be divided into sections or stations of ten to twenty miles, which may be in their turn subdivided into sections of one mile. At each station a sentinel-post is set, containing a rod with a large pointer working up and down in front of a scale on the outside of the posts. These posts may be made to present four such scales, two of which will be in a position lengthwise, and two in a crosswise to the road. A brilliant light may likewise be used at night, instead of the pointer, which can be seen at a great distance. The section-wheel is provided with teeth like those of a saw, and are set off to correspond in number to the marks upon the scale, being cut so as to only allow the section-wheel to revolve one way; and as one specified portion of the road is travelled by the train, it instantly re-sets itself for another.

A strong semi-circular lever is likewise fastened to the track, at a little distance from these posts, having one end connected to the medium, and which is gradually pressed down by means of an arm and pully extending from the side of the engine-car, by means of which the mediums are drawn either way, both behind and before the train, moving the whole connection of devices, and thus showing the position and motion of the cars by day or by night; so that any engine-driver or conductor, before starting for a depot, can always know whether another train is on the section before him; and hence accidents by collision will be only the result of the most stupid carelessness.

The agent or superintendent of the road may also have a small wire extending from the road to his office, affixed to a dial or index scale, showing there the operations of the train from day to day. Persons at draw-bridges, cross-roads, or any other point of extreme danger, can tell whether the train is near or not, thereby preventing, in many instances, the great destruction of life and property which has become so frequent and alarming upon the best conducted railroads.

Any further information respecting the above invention can be had by addressing the inventor, H. B. LAWTON.

Eagle-Mill, Rensselaer County, N. Y.

IRON HOUSES.

WE attended last evening, an informal meeting of business men, at the auction rooms of M. N. Croft, Court street, Brooklyn, at which Mr. Sexton, the inventor of a new plan of iron buildings, explained his system. He constructs the frame-work of his buildings entirely of cast-iron, in sections, which are made to interlock by very close-fitting and ingenious joints, secured by keys. This method of building avoids the labor of drilling and bolting, which has been a great inconvenience of iron buildings. It also allows the house to be taken down in sections, and removed at very little expense. The frame-work he covers on the outside with plates of iron, by a system of interlocking, without any bolts or other fastenings, the joints being packed with gutta percha, so as to exclude water under hydraulic pressure. To finish the dove-tailing of the joints, he has invented a machine that can perform the work of forty men. The walls are made hollow, and the inclosed space is filled in with a non-conducting composition of beach-sand and other substances, so

that, as Mr. S. observed, his house, when finished, becomes throughout a perfect fire-proof safe. The roofs and floors are made of cast-iron frames, resembling heavy window-sashes, the interstices being occupied, as in the case of windows, with plates of glass, of any required thickness and transparency. The glass used is not our common glass, but it is itself a new invention, being called malleable glass, from its wonderful property of toughness, allowing it to bend freely without breaking. It can be drawn out into threads of any fineness, and so strong and flexible that they are said to be commencing the manufacture of piano and violin strings from this material. Mr. S. handed round a piece of this glass-string for inspection. It was as small as the E-string of the violin, and could be bent around the finger, or tied in a knot, apparently like catgut.

Plates of this glass being let into the frame-work of the floors, the whole is then covered over with a peculiar transparent cement of Mr. S.'s invention, which makes the whole floor look like one solid plate of glass. The cost of roofing with this material is 75 cents per square foot. The walls inside can be covered with plaster, or finished with iron or glass, at the option of the builder. All the interior ornamentation may be of malleable glass.

The advantages claimed for this style of building are, first, its great cheapness, and the rapidity which it allows in construction. It effects a saving of one third in cost, and three fourths in labor, over every other method. Mr. S. stated that he could complete an ordinary dwelling-house in forty days. Second, the variety of style and finish that can be obtained at small cost by different combinations of the same patterns. The inventor remarked that in the construction of the whole Crystal Palace but six different patterns of castings were required. Third, the facility with which such a building can be taken down and removed. Fourth, its security from damage by fire or lightning—thus saving all the expenses of insurance. Other incidental advantages are its durability, freedom from vermin, etc.

It is proposed to form a company for the manufacture of these houses, with a capital of $150,000.—*N. Y. Leader.*

SHOE BUSINESS.

The following statements illustrate the benefit of a variety of pursuits, and especially of mechanic trades:

A Busy and Growing Place.—The population of Milford, Mass., at present exceeds 7000. The number of buildings erected last year was 78, valued at $173,200. The number of boot-manufactories is 40, which turn out 1,450,198 pairs. Their value in 1853 was $2,594,346. Number of firms engaged in mercantile business last year, 46, the amount of whose business was $1,050,800. Amount of woollen manufactures, etc., $285,000. Total business, $4,103,346.

The Legislature has just passed a bill to establish a police-court in Milford, and the Judge's salary is to be $300—not a very tempting inducement; yet it is said there are several anxious competitors for the appointment.

The Shoe-Business in Haverhill, Mass.—The *Haverhill Banner* says there are more than two hundred different kinds of shoes manufactured in that town, from the brogan to the finest kinds of ladies' shoes, the sales some

days amounting to from seventy to eighty thousand dollars. It is estimated that there are at least five million pairs manufactured annually, the shoe-business of the place being only second to that of Lynn, the great shoe-mart of the country.

It is stated, also, that Massachusetts manufactures annually two pair of shoes for every man woman, and child in the United States.

SCULPTURE AND SCULPTORS.

The age in which lived the great men we have already described was wonderfully fruitful of those whose renown in this great art has come down to our times, and whose works confirm the truth of their biographers.

Piero da Vinci was the nephew of Leonardo, and from early boyhood gave proof of remarkable genius. He commenced with painting, but afterward abandoned that beautiful art for what he regarded as better suited to his genius, and he was placed under the care of Nicolo, who was surnamed Il Tribolo. Piero began immediately to design, and soon outstripped his companions. A block of marble being given to him to carve from it a boy, as an ornament for a fountain, he proved himself equal to the higher styles of the art. All his works, even then, discovered wonderful lightness and grace. Among others which excited astonishment, was a Christ fastened to the cross, which was executed before he had attained his eighteenth year.

After this, he went to Rome, for the purpose of studying the works of Michael Angelo. But he died ere he had entered his twenty-third year.

Antonio Canova may be regarded as the restorer of sculpture in Italy. Since the time of Michael Angelo, there had been no one who was equal to him. He was born at Passagno, a town at the foot of the Venetian Alps, near Treviso, in 1757. His father, Pietro, and his grandfather, Pasino, were sculptors of some repute. At three years of age, by the death of his father, he became an orphan, and his mother being married shortly after, he was left in the care of a paternal aunt, Caterina Ceccato. For the rudiments of the art of sculpture he was indebted to his grandfather. Some of his boyish amusements in the way of forming models, being shown to Falieri, a patrician of Venice, he was placed under the instruction of Toretto. On the death of Toretto, he was placed under the care of Geo. Ferrari, nephew of Toretto, and worked with him on the statues that embellish the gardens of the Casa Tiepolo, at Carbonara. He also studied at the Academy of the Fine Arts, at Venice, where he won several prizes. Two baskets of fruit, executed by him in marble, when only fourteen years of age, which attest his proficiency, are to be seen on the first landing-place of the Farsetti Palace, now the Hotel della gran Brettagna, at Venice. In his sixteenth year, he executed his Orpheus and Eurydice. Dedalus and Icarus were executed soon after. In 1780, he went to Rome, and in the course of a year he obtained a pension from the Venetian government.

Pope Pius afterward appointed him Inspector-General of the Fine Arts in the Roman States. In 1810, he was invited to Paris, by Napoleon, when First Consul, which invitation he accepted. While at that court, he executed a colossal statue of the Consul in marble, and afterward one in bronze, and another of Maria Theresa, as Concordia. This is now in the palace at Parma. He received there the highest honors.

The imperial court of Vienna greatly desired to possess his works, and induced him to send a copy of his Theseus overcoming the Minotaur. The Emperor Francis ordered a temple to be erected in the imperial gardens for its reception. But the death of the sculptor prevented the execution of this design. He died at Venice in October, 1822.

His Cupid and Psyche, his Venice and Adonis, the Dancers, the Graces, Paris, Mars and Venus, and his Repentant Magdalen, abundantly establish his reputation as a great sculptor. These, with the devotional figure of Clement XIII., the Blind Man in his Monument of the Arch-duchess Christina, the Pugilists, Hebe, Polymnia, and the group of the Piety, of many of which no known models are furnished by antiquity, place him among sculptors of the highest rank.

A monument to the memory of Vittoria Alfieri, was perhaps his most elaborate work. It was executed at the request of the beautiful but unfortunate wife of the Pretender, Charles James Edward Stuart, grandson of James II.

A copy of his beautiful Hebe, executed by Tommaso Lazzerini, will be remembered by the visitors at the Crystal Palace. It stood, till recently, in the south nave.

Alfred Thorwaldsen was born at Copenhagen in 1770. When eleven years of age, he was placed by his father, a rough carver in wood, in the dock-yards of that city, in the Academy of Copenhagen. Here he obtained the highest marks of approbation. In 1787, he obtained a prize. In 1797, he went to Rome. In 1803, his "Jason" excited the admiration of connoiseurs, as it did of the multitude. It seemed a revival of the epoch of Phidias and Praxiteles. Mr. Thomas Hope, an English gentleman drawn by accident to his studio, so much admired it that he ordered a copy in marble, paying a very handsome price. This was the commencement of a series of brilliant successes terminating only with his life. From this time his reputation greatly and rapidly increased, and very soon he acquired both fame and wealth.

His most renowned work was executed in 1812, for the pontifical palace on Mount-Cavallo, which was to receive the Emperor Napoleon. Wishing to make an ingenious allusion to a great conqueror who was about to enter the capital of the world, he modelled with inconceivable rapidity the "Triumph of Alexander." This bas-relief was placed in the palace in July, 1812, and excited universal admiration. It even procured for him the title of "Father of bas-relief."

Among his famous works at this period, were Day, Night, Priam and Achilles, and Achilles and Briseis.

In 1819, he visited his native country, and was received with great public demonstrations of joy. It was during this visit that he conceived the idea of those decorations of the Church of Notre-Dame, at Copenhagen, which have made it one of the most interesting in Europe. On his return to Rome, he was received with marked honor by all the sovereigns and princes whom he met, and he soon became one of the most popular artists in Italy. Students and young artists flocked to him for instruction. Orders were sent to him from every quarter, and he also received other distinguished tokens of regard. As he passed along the streets, all bowed to him.

In 1828, he commenced his arrangements for carrying out a plan, long entertained, of leaving to his native country and city a legacy of his own productions, and of other works of art that should be alike honorable to all. In 1837, was commenced the erection of a building, designed by himself, to contain these works, and in the following year a royal frigate was sent to convey the rich gift to Copenhagen. In August, he himself embarked for his

native country. Never was king received more joyfully by his loving subjects, never a hero had so brilliant and triumphant an entry. In 1842, another frigate, the Thetis, took from Rome eighty cases more of these works of art, he having previously returned to that city.

In his last visit to Denmark, he executed two bas-reliefs, "Christmas Joy in Heaven," and the "Genius of Poetry."

His last work was the statue of Hercules, which now adorns the façade of the palace of Christiansburgh, at Copenhagen.

He died in the theatre in Copenhagen, March 24, 1844. The King of Denmark, and all the people of the city, followed his funeral-car, while the news of his death plunged the whole country into profound grief.

His works are very numerous, for he was constantly employed, even when surrounded by his friends, who were engaged in conversation.

The visitor at the Crystal Palace has not overlooked the group (very badly arranged) of the Saviour and his Apostles. In the church for which they were executed, the apostles stand in two aisles, along the length of the church, while the Saviour is placed behind the altar, surrounded by drapery, and at a considerable distance from the beholder. The statues of the apostles are executed in connection with certain symbols, which are not without meaning. Thus:

Paul bears a sword, the symbol of this glorious martyr.

St. Peter carries the keys. His right hand is raised to heaven, as if he could see that which he revealed, the God unknown to the sages of Greece.

St. John, with an eagle at his feet, the symbol of the penetration of his spirit. He has the posture of a man in ecstasy, as if he heard the sound of the angel's trump, while he is at the point of writing upon the tablet which he holds, the thoughts which occupy his mind.

Matthew, the Evangelist, is represented as about to write. He is meditating, as if seeking for true words. An angel by his side seems to dictate to the apostle the gospel which he indites.

Thaddeus is represented in a devotional mood. His hand is raised, as if in prayer, and his countenance and whole aspect as if absorbed in the contemplation of God.

St. Andrew bears a cross, the instrument of his own martyrdom.

St. Simon holds a saw, the glorious trophy by which he became a martyr.

Bartholomew holds a knife, to indicate the manner of his death.

St. Thomas holds a carpenter's square, to denote his former calling.

St. James, the Less, holds a club, with which he was beaten to death.

St. James, the Greater, holds a staff as a pilgrim, and as one who would continue his route; his hat being suspended from his shoulders.

The Angel of Baptism, in the centre of this group, is also very celebrated. The original, we are informed by a good critic, who has seen it, is very beautiful. This copy in plaster fails to give the remarkable expression to be seen in the countenance of the original.

This group, (with the bas-reliefs mentioned below,) is on sale. The proprietor hopes to sell it to some church. His price is about $3000.

Mercury, by Thorwaldsen, is also in the Palace, and is very fine. He appears to be engaged in playing the "flute," (pipes,) in which he so excelled, that by his enchanting music he opened the hundred eyes of Argus, when sleeping. It is at this moment of his triumph, that the artist has presented him, at rest, and viewing these wonderful effects of his own skill.

Ganymede and the Eagle, and *The Graces*, exquisite works of Thorwaldsen, are also in the Crystal Palace

Hope, a copy in bronze, also stands in the South Nave.

The following beautiful bas-reliefs are also now to be seen in the Palace, all the work of this great sculptor:

Bacchus and Cupid; Love and Psyche, (he is awaking her from sleep;) The Vintage; The Guardian-Angel; The Gathering of Apples, (with Cupid upon a Swan;) The Course of Human Life; The Holy Virgin, Christ and St. John; Pan and a young Satyr; Pan and a Hunting Nymph; Day; Night; and The Angel of the Last Judgment.

FISHER'S STEAM-CARRIAGE

HAVING tried his experimental carriage sufficiently to prove that, even if no greater economy can be attained than is actually attained in this first experiment, steam-carriages may be worked at less than two thirds the daily expense of horses, Mr. Fisher is now endeavoring to obtain capital to build a drag, (or carriage to draw others,) of about two tons weight; which is about the maximum weight that can be borne without injury by weak roads, and which will test its economy on all kinds of roads.

In answer to inquiries as to why he does not run his carriage where it can be seen by those who wish to be interested, he informs us that it is not sufficiently finished to run for hire; and he can not spare the time and money to run it gratuitously: but he is ready to run it for the information of those who agree to invest money as soon as he demonstrates what he states. And this course he deems but a just precaution against certain men who possess capital, and intend to engage in running steam-carriages as soon as they are convinced that they will pay. If these men will come to him, and agree to furnish capital when he has shown that it will pay, he will show them; but while he believes that they intend to set his labors aside, and go to the professional machinists, and thus rob him of the reward due to his efforts and outlay in reviving this invention, he will not give them any evidence beyond his simple statement; and would not give them even this, if he could accomplish his ends without some degree of publicity.

The success of steam-carriages does not now depend upon improvements in the invention, for which protection may be obtained by patents, so much as upon improvements in the proportions and details, for which no protection whatever can be obtained. As an example of the change of proportion required to adapt steam to different uses, we may mention that the old rule is, to give one square foot of grate surface, and nine square feet of boiler surface, to vaporize one cubic foot of water per hour; but, after twenty-six years of expensive practice, the proportions now recommended, in CLARK'S work on Locomotives, are one foot of grate and a hundred feet of boiler surface, to vaporize twenty-two feet of water per hour. And it is probable that proportions as different from the locomotive as those are from the marine boiler, will be required for the perfection of steam-carriages; and for these improvements in proportion no protection can be obtained; but every covetous jockey can adopt them, as soon as they are found, at the expense of others.

There is, however, considerable improvement possible in the invention, which may be patented. And it is the opinion of two able engineers, who built steam-carriages in England, that Mr. Fisher has made such improvements; and that his arrangement of machinery is much better than any they

have ever seen before. These engineers are Mr. JAMES STONE, who built Gurney's carriages; and Mr. M. BARAGWANATH, who built Hancock's carriages. If these improvements turn out as well as the opinions of these experienced engineers warrant our expecting, a profitable monopoly may be maintained against those who stand ready to help themselves, not only to all the old inventions, but to all the improvements in proportion and execution which men of genius and liberality may make, at great sacrifice of their talents, time, and money.

We think it fairly probable, then, that those who accept the invitation that Mr. Fisher has given to capitalists, inventors, and machinists, to join him in his enterprise, will find it profitable. If a small capital, for a few experimental carriages, is managed by good trustees, and the mechanical arrangements are successful, then the capital may be increased to a large amount, enough to resist the opposition of those who can not be restrained except by the arm of civil law. But if the improvements of Mr. Fisher be of great value, so much the more sure of profit.

We have seen occasion to contradict assertions that this invention failed in England, simply because it is impossible to run steam-carriages with profit on common roads. If these assertions were but the usual assurance of ignorance, that disbelieves and denies all that it has not seen, we might let them rest; but they are reïterations of an atrocious lie, for which the British House of Lords is responsible. We have examined the evidence upon this subject, published by order of the House of Commons, and are fully convinced that steam-carriages were mechanically successful, and would have become profitable, had they not been denied legislative protection against prohibitory tolls, obstructions upon the roads, and violent opposition of all kinds that could be made; and finally denied licenses, and driven off the roads by magistrates, for no fault but because they were likely to supersede horses, and thus diminish the demand for the produce of land. Such a system of oppression would be incredible, did we not know that for thirty years the landed interest kept up corn-laws, which made food nearly twice as dear in England it was in the rest of Europe.

ARMAMENT OF A SHIP-OF-WAR—THE MONTEBELLO.

THE journal, *France Maritime*, has treated with much ability all the scientific as well as practical questions connected with the fitting of ships of war for sea, and furnished very instructive articles for those interested in ship building and naval warfare. Lately it gave a full account of the armament of the Montebello, a 120-gun ship, which we give in translation:

"The armament of a man-of-war is one of the most difficult tasks. The naval officer has not only to plan how to store away in the most convenient manner the various objects of armament and the provisions, but he has also to distribute them in such a manner that their weight will correspond properly with the displacement of the water, without injury to the speed-management of the ship, and to provide for sufficient room to work the guns. To obtain these desirable results many changes have been introduced in the arrangement of the Montebello. The iron ballast has been diminished, in order that the centre of gravity may not fall too low. The guns of the upper and quarter-decks are no longer fore and aft as formerly, whereby the bow and stern

were overloaded. They are also removed from between the shrouds, where they could not be worked properly. The guns are placed now mid-ships. Before the year 1815, such ships had 132 guns; this number is now reduced to 120, and nevertheless the actual force of the ship is not diminished. The whole arrangement is better, gives more room for communicating with one part of the ship from another; the crew, consisting of 1089 men, are able to come on deck much easier when required for manœuvering and boarding. The hospital has been placed and arranged with quite philanthropic care; the sick have their own kitchen and dispensary near by. The stowage in the hold has been rendered more simple and regular by the introduction of sheet-iron chests, and by the adoption of chain cables instead of hempen ones. All the store-rooms are placed in the hold. The storage of such a quantity of divers articles in that narrow space called the general magazine, is truly a masterpiece of order and skill. The hold contains provisions for six months, with a reserve-supply for another six months; water for 135 days. Battle being the purpose of the armament of a man-of-war, all that belongs to it must be disposed in such a manner that no impediment and interruption will occur during the engagement. The passages between the powder-magazines must be so arranged that no interruption or disorder in the distribution of munitions to the different batteries can occur; neither must the removal of the wounded from the decks down the hold meet with any delay. The Montebello is 196 feet long, and but 50 feet beam. She carries 120 guns, of which 32 are of the calibre of thirty-six, 34 of twenty-four, 34 of eighteen, and 20 carronades of thirty-six. She can pour out at once 3300 lbs. of iron. The crew is composed of 1089 men. The supply of provisions for six months for the crew consist in: 158,122 pounds of biscuit; 61,060 pounds of flour; 49,484 pounds of salt meat; 61,120 pounds of dried vegetables, rice, cheese, etc.; 134,652 quarts of wine; 4390 of brandy; 67,722 pounds of coal; 140 cords of wood; and 367,000 quarts of water, at the rate of 25 quarts per day for each man; 9840 cannon-balls and 160 packages of grape-shot of different calibre; 61,500 pounds of powder, etc. The whole contents of the Montebello amount to 2730 tons, and yet there is every-where space, air, and light; 1089 men live, move, and manage 120 guns as easily as on the Champ de Mars. The surface of the sails offered to the wind is 5601 square yards. The following dimensions and materials are employed in the construction of a three-decker: The length of the keel is 180 feet; the whole construction requires 113,000 cubic feet of wood, at 6 francs the foot. The width is about 52 feet, the depth 25. The three batteries are armed with guns of different calibre, as in the Montebello. The main-mast is 120 feet high, and measures 9 or 10 feet in circumference; it weighs 40,000 to 42,000 pounds. The main-top-mast that rises above the main-mast is 72 feet high, and, with the gallant-mast, the main-mast measures 250 feet. (The towers of Notre Dame are only 200 feet high.) The main-yard has 115 feet. The vessel must have a crew of 1000 to 1200 men, and may carry, beside, 500 or 600 soldiers.

The construction of such a ship requires 140,000 pounds of iron of all kinds; 56,000 pounds of copper in bars and nails; 2600 sheets of copper for the sheathing, weighing 31,000 pounds nails; and copper, also for sheathing, 5000 pounds; whole amount of copper, 90,000 pounds; iron nails, 1000 pounds; rolled lead, 6500; tow, 49,000; pitch, 15,000; tar, 9000. The sails require 31,500 yards of canvas, and the vessel having commonly two sets of sails, that amount is doubled. The great flag requires 270 yards of stuff; the ship requires 7000 tons of iron for ballast; and under sail and perfectly equipped, weighs over one thousand million pounds."

FOR THE PLOUGH, THE LOOM, AND THE ANVIL.

CURE FOR GARGET AND FOR WOUNDS.

MESSRS. EDITORS: In a number of the above-named work, there was a recipe, not long since, recommending the Iodide of Potassium as a remedy for gargety cows.

A gentleman in the town in which I reside, informed me he had a valuable cow afflicted with that disease; thought he should lose her, or be compelled to stall-feed her for beef. I gave him some of the iodide, with directions how to use it; the cow mended, (as averred by the owner,) in three days, and yet remains well, this being in the month of March.

Another in the neighborhood has lately been cured by the same medicine.

My object in making this public is, that our farmers may be assured the recipe is no hoax, but an invaluable remedy.

Recipe for healing wounds in domestic animals:

Take of sulphate of iron (copperas) ℥ i., one ounce.
Sulphate zinc, ʒ i., one drachm, (white vitriol.)
Water, one quart. Mix.

Keep a cloth or cotton-batting on the wound, wet with the liquid. It will heal readily.

Our farmers here make great account of this wash. Any one may make a trial with little expense. Yours, truly, ARIEL HUNTON.

Hyde-Park. June 21, 1854.

STATE AND COUNTY FAIRS FOR 1854.

STATE FAIRS.

Michigan, at Detroit,	Sept.	26 to 29.
Ohio, at Newark,	"	19, 20, 21, 22.
Vermont, at Brattleborough,	"	13, 14, 15.
Illinois, at Springfield,	"	12, 13, 14, 15.
Pennsylvania,	"	27, 28, 29.
New-York, at New-York,	Oct.	3, 4, 5, 6.
Connecticut, at New-Haven,	"	10, 11, 12, 13.
Indiana, at Madison,	"	4, 5, 6, 7.
Iowa, at Fairfield,	"	25.
Wisconsin, at Watertown,	"	4, 5, 6, 7.
New-Hamphire,	"	3, 4, 5, 6.
Maryland, at Baltimore,	"	3, 4, 5, 6.
Georgia, at Augusta,	"	23 to 28.
Springfield Cattle-Show, Ohio,	"	25, 26, 27.
Missouri, at Boonville,	"	2 to 6.
Lower Canada, at Quebec,	Sept.	12, 13, 14, 15.
Upper Canada, at London,	"	26, 27, 28, 29.

N. Y. COUNTY FAIRS.

Putnam, at Carmel,	Sept.	26, 27.
Washington, at North White Creek,	"	21, 22.
Franklin, at Malone,	"	20, 21.
Jefferson, at Watertown,	"	21, 22.
Albany,	"	26, 27, 28.
Duchess, at Washington-Hollow,	"	24, 25, 26, 27.
Oneida, at Rome,	"	19, 20, 21.
Columbia, at Chatham Four-Corners,	"	29, 30.
Delaware, at Delhi,	"	20, 21.
Rensselaer, at Lansingburg,	"	19, 20, 21.
Farmers' Society, at Morris,	"	20. 21.

EDITORS' JOTTINGS AND MECHANICAL RECORD

Locomotives for High Grades.—The high prizes offered by the Austrian government for the locomotive best constructed to overcome the high grades of the Sömmering Mountain, have created quite an emulation among inventors; but all the improvements have tended more or less to increasing the size of the locomotive. M. Andraud seems to be the only one who has left the old beaten track, and invented a locomotive which promises to answer the purpose fully. He only changes the driving-wheels; all the other parts of the locomotive remain the same as are in use at present. This machine has six wheels. The drivers are placed in the centre. The rims of the drivers are very broad, much more so than those commonly in use. The part of the rim which projects considerably beyond the ordinary rail is striated. This is all the change he makes in the locomotive. Where there is a considerable grade, which requires a much greater power to overcome it, he employs a wooden rail, which he places on the outside and contiguous to the rails, of about five or six inches in width, rising a little above the surface of the iron rail, so that the striated portion of the drivers must impinge upon it. The striated part of the driving-wheels, and the wooden rails, are the only mechanical means with which M. Andraud proposes to overcome even much higher grades than have been hitherto attempted. The wheels are only put into action when their assistance is required. On straight lines the wooden rails would be placed on both sides of the iron rails; in curves of small radius, on the outside of the inner rail of the curve. The practicability of M. Andraud's invention is generally admitted, and he no doubt will obtain permission to experiment on some government road with higher grades.

A New Railroad-Brake.—M. Andraud has invented a new railroad-brake, which consists in a strong metallic reservoir, holding about 150 to 180 quarts. This reservoir is filled with compressed air, of eight or ten atmospheres, by means of proper pumps, which are worked by the locomotive. The reservoir is provided with a manometer, safety-valve, and a proper stop-cock, and so arranged and situated that the engineer can easily manage and observe any part of it. When a special person is employed to superintend the apparatus, it can be placed upon the tender. Every car is to be provided with a tube of an inch or more in diameter, each tube having on both ends elastic tubes, by means of which the tubes of each car can be connected with those of the other cars, so as to form a continuous communication with the air-reservoir. Each car is furnished with two cylinders of five inches diameter, which are placed below and on each side of the car-body. Each cylinder has a piston, to the ends of which the brakes are attached; the cylinders are connected with the long conducting-tubes, and when the air is let into the cylinders, their pistons are pushed out and force the brake against the wheels. When the air is stopped off, a spring or some elastic fixture withdraws again the brake from the wheels. The chief brakeman at the reservoir, who manages the apparatus, can by a single turn of the stop-cock act at once upon all the brakes at any moment's warning, which may be given by means of an electro-magnetic signal from any car in the train. The brakeman has only to keep his reservoir always properly charged, as the manometer indicates. M. Andraud calculates the expenses thus: The reservoir and air-pump, placed on the locomotive or tender, $1000; the apparatus, including the brakes attached to each car, $140.

The use of steam has been proposed for the same purpose and in a similar manner, but the unavoidable condensation of the steam, the filling up of the cylinders with condensed water, and the liability of bursting the tube in cold weather, are sufficient inconveniences to prevent its use. Condensed air is no doubt much preferable.

Gold in South-Carolina.—A vein of gold has been discovered upon the lands of James Lay, in Cheohee, S. C., which promises to prove extremely rich. The gold is encased in hard quartz, and is visible to the eye in large quantities.

CREEPING THINGS.—Let me put a spider into any lady's hand. She starts back aghast. She shrieks, "the nasty ugly thing!" Madam, the spider is perhaps shocked at your Brussels laces, and, although you may be the most exquisite painter living, the spider has a right to laugh at your coarse daubs as she runs over them. Just show her your crochet-work when you shriek at her. "Have you spent half your days upon these clumsy anti-macassars and these ottoman covers? My dear lady, is that your web? If I were big enough, I might with reason drop you and cry out at you. Let me spend a day with you and bring my work. I have four little bags of thread—such little bags! In every bag there are more than 1000 holes—such tiny, tiny holes! Out of each hole a thread runs, and all these threads—more than 4000 threads—I spin together as they run, and when they are all spun they make but one thread of the web I weave. I have a member of my family who is herself no bigger than a grain of sand. Imagine what a slender web she makes, and of that, too, each thread is made of 4000 or 5000 threads that have passed out of her four bags through 4000 or 5000 little holes. Would you drop her, too, crying out about your delicacy? A pretty thing, indeed, for you to plume yourself on your delicacy, and scream at us."

Having made such a speech, we may suppose that the indignant creature fastens a rope around one of the rough points of the lady's hand, and lets herself down lightly to the floor. Coming down stairs is noisy, clumsy work, compared with such a way of locomotion. The things we scorn are miracles of beauty. They are more delicate than any ormolu clock or any lady's watch, made, for pleasure's sake, no bigger than a shilling.

Lyonet counted 4041 muscles in a single caterpillar, and these are all a small part only of its works. Hook found 14,000 mirrors in the eye of a blue-bottle, and there are 13,300 separate bits that go to provide for nothing but the act of breathing in a carp.—*Dickens' Household Words.*

VEGETABLE MECHANICS.—There is a remarkable tree on the farm of the late Hon. Olney Ballou, of Cumberland, R. I., which is an emblem of himself in his struggles against the obstacles of life. An old elm standing near a mass of rocks died. A young elm then appeared in a fissure of this rock, casting down its slender roots, and in twenty or thirty years it has become a foot and a half in diameter. Its roots have penetrated into and under the rock, and have lifted and thrown off about seven tons of it, and have loosened and partly lifted ten tons more, which in a few years will be separated from the mass. The roots, to bear the immense pressure upon them, have become changed from the ordinary appearance, and have a tough casing which may be compared to the skin of an alligator. The provisions thus made by nature for the growth of the tree under such difficult circumstances, furnish a striking specimen of what might be called vegeble mechanics.

HAIR AND FEATHERS.—The business which is carried on in these familiar and seemingly insignificant substances, of which our beds and cushions are mostly made, is a great branch of trade. The *Journal of Commerce* says that the local trade of New-York, in these two articles, is about $3,000,000. The firm which is most largely engaged in it consume annually $700,000 worth of hair and $1,000,000 worth of feathers. The feathers are purchased in the markets of Russia and South-America, and the hair, or at least a large portion of it, once floated gracefully to the breeze in the shape of the manes or tails of the wild horses of the South-American pampas. Immense numbers of these horses are killed annually for their hair, hides, and fat. The latter substance, upon its arrival in New-York, is transmuted into soap, and is doubtless often admired for its aroma and variegated colors. The *Journal of Commerce* says the process of preparing the hair is as follows: From the bales it is thrown into a "picker," making 800 revolutions per minute. After being thoroughly picked, it is twisted into ropes by machinery. This is done for the purpose of making it curl. It is next put into vats and boiled, for the purpose of cleansing it, after which it is thoroughly dried in an oven. The ropes of hair are then picked to pieces, and the hair is ready for use.

SECRET DISPATCHES.—A Paris letter to the *New-York Courier* says that the Olympic Academy of Vicenza, Italy, having carefully examined the discovery made by their fellow-citizen, Tremeschini, of electric telegraph by secret transmission, has publicly declared it to be a perfectly successful invention. The commission appointed to test its efficacy was composed of the Councillor Delegate of the Podesta, the Superior Commissary, and the Academic Council. The first experiment consisted in sending and receiving a dispatch in the common way, without secresy. In the second experiment, a dispatch was sent secretly, and the answer received in the same manner, by the aid of the new apparatus. In the third, a dispatch was sent openly, and the answer received secretly, to show that the secret apparatus might be used or suspended at will. The results of the inquiry show: 1. That the apparatus of Tremeschini may be applied to Morse's telegraph; 2. That when the dispatch is sent secretly, it can only be received so, any fraud in that respect being subject to immediate detection; 3. That secresy may be suspended or applied at pleasure. The report of the commission is highly eulogistic of the invention.

PROTECTION TO BANK-NOTES.—A new plan to prevent alteration of bank-notes, has just been invented by a young gentleman of this city. The great inducement for rogues to alter bills is the large portion of the genuine engraving which will remain on the note after the alteration is made, it being necessary for them to supply but a small amount of spurious work in place of that which they remove. This plan annuls that inducement, as from bills protected by it almost every particle of genuine engraving, and both signatures, must be erased before the counterfeit work can be added. No one will attempt to *alter* a bill, if they are first obliged to engrave a counterfeit plate. The inventor is Mr. Lloyd Glover, agent for the Bank-Note Engraving House of Danforth, Wright & Co., of New-York and Boston. This plan is now in the hands of the artists, and will soon be ready. Models may be seen at the Boston office.—*Boston Atlas.*

PROTECTING CLOVER HAY-STACKS.—Josiah Lackey writes to the *Iowa Farmer*, that he has tried to preserve clover-hay from the effects of the weather in the following manner, and found that it answered as well as if the hay had been put in a barn. Clover-hay put up in the ordinary mode, like Timothy, is apt to get musty and unpalatable, but put up in the mode recommended, it comes out good and sweet. He says: "When the stack, which is commenced the usual way, is raised to about one half its destined height, the ends of long wheat or rye straw are placed just on the edge of the stack, so that when the next layer of hay is placed upon it, the principal length of the straw will droop over the sides of the stack. Following this plan until the stack is finished, a complete and impervious covering is furnished to the hay, that will keep it nearly as well as the best barn. I think that the long cane-grass that grows in the sloughs of this country will answer a much better purpose, the straw being longer, and will turn quite as well."

TELEGRAPH APPARATUS.—Messrs. Brunner & Hipp, directors of the telegraphs of Switzerland, have invented a portable apparatus by means of which they can make connection with the wire at any point of the line, and communicate with the principal stations. The trial has been made at some point about five miles from Berne, where there exists no telegraphic station. The apparatus was connected with the wire, which communicates with Zurich, Basle, Geneva, and La Chaux du Fonds; messages were transmitted, and the answer immediately received. How much this apparatus differs from similar ones employed in the United States, I am unable to say; but, as far as I know, the thing has been already accomplished.

FITCHBURG, MASS.—This town has now $2,904,082 of taxable property, being an increase of some $600,000 since last year. The number of polls is 1754; the per cent of tax on property, .009. There are 283 persons paying a tax of more than $25, the highest on the list being Alvah Crocker, who pays $476.09. The total amount of property in the town, including the town-farm and church, is considerably more than three millions of dollars.

CHARLES OAKFORD'S HATS.—We published quite recently, a full statement of the past and present condition of this establisment, so well known in Philadelphia, and to many from abroad, who have become its patrons. We are most sensibly reminded of the excellence of his manufacture, by the remarkable degree of comfort experienced in the wear of one from his establishment during this excessively hot weather. We think we never wore so comfortable a hat. Go or send at once to Chestnut street, Philadelphia, and get one, if not already well supplied.

COTTON MANUFACTORY IN THE SOUTH AND WEST.—The Louisville papers state that the success of the extensive cotton-manufacturing establishment of H. D. Newcomb & Brother, of Louisville, at Cannelton, Ky., during the last year, has been unprecedented in the history of modern manufactures. Their mammoth mill now in operation at that place, turns off a daily production of goods, such as the very best domestic fabrics in market, equal to 15,225 yards.

The *Columbus (Geo.) Inquirer*, in noticing the first shipment of cotton-yarn to New-York, by the "Southern Rights' Manufacturing Company," of Monticello, says:

"Some of our Columbus factories have been in the habit of sending pretty large orders to New-York and Philadelphia, for more than twelve months past, which goes to prove that we are no ways behind the rest of the world, either in the facility for furnishing goods of superior quality, or at rates as favorable to the large purchaser as those at which he can buy the same goods nearer his own door. And the *cream* of the circumstance does not stop here, judging from a single transaction that occurred during the summer of 1853. A bale of goods manufactured in this city was sent to Philadelphia and sold. The next steamer from that city brought back the identical bale, which had been purchased by a merchant from the interior of Georgia, and who, on being told the cloth was made in Columbus, remarked, he thought it was the cheapest and best piece of goods of the kind that he had purchased for many years."

Up to the 1st September last, there had been shipped from Wakulla, Florida, 301 bales of cotton yarn, valued at $9050, all of which was manufactured at the Madison Factory, owned by Captain N. P. Willard. Since then there has been shipped 534 bales, valued at $16,020. Of these, 456 bales were manufactured at the Madison Factory, and 78 bales at the Monticello Factory. A small lot, manufactured at Madison, has been shipped from Cedar-Keys. The yarns from these mills are now sold in most of the stores of Middle-Florida, and the adjoining counties of Georgia.

The Monticello Factory (says the *Wakulla Times*) has been for some weeks manufacturing cotton cloth of a good quality.

SOUND OF BELLS.—The nearer bells are hung to the surface of the earth, other things being equal, the farther they can be heard. Franklin has remarked that many years ago the inhabitants of Philadelphia had a bell imported from England. In order to judge of the sound, it was elevated on a triangle, in the great street of that city, and struck, as it happened, on a market-day, when the people coming to market were surprised on hearing the sound of a bell at a greater distance from the city than they ever heard any bell before. This circumstance excited the attention of the curious, and it was discovered that the sound of a bell struck in the street reached nearly double the distance it did when raised in the air. In the air, sound travelled at the rate of from 1130 to 1140 feet per second. In water, 4708 per second. Sounds are distinct at twice the distance on the water that they are on land.

WISCONSIN.—The farmers of Wisconsin have commenced cutting their wheat. It is said that the crop will be a large one. The recent storm has done it no damage. The weather is now most favorable.

THE *Boston Atlas* states that the clothing business of Boston amounts to $12,000,000 or $15,000,000 annually. There are four houses which give employment, directly or indirectly, to about five thousand persons, each scattered throughout the New-England States, in most of which they have agencies.

SCHOOL-FURNITURE.—Whoever remembers the uncomfortable bench and ill-constructed desk of the old school-house, will rejoice to see the improvements of the present day. The manufacture of school-furniture by Mr. R. PATTEN, 24 Grove street, of this city, is a regular business, carried on by the aid of steam-power. He now employs from thirty to fifty hands in this business, and is able in a day to furnish desks and chairs or seats, graduated to the various ages of pupils, sufficient to supply an ordinary school-room. Tables, book-cases, draft-boards, etc., are among the numerous articles always on hand. Desks for counting-rooms, etc., are also made to order.

It is worthy of note that the school-chair or seat is so constructed and secured to the floor by an iron pedestal, that it offers no impediment to sweeping or cleaning—a great consideration.

NEW BOOKS.

THE PRACTICAL MECHANIC'S JOURNAL. Vol. 7. London and Glasgow: W. & J. H. Johnson. New-York: Stringer & Townsend.

THIS journal is printed and published in England, and is sold by our enterprising neighbors as above, who are the agents for this country. Three numbers of this volume have been received from the American agents. It is issued in monthly numbers, in quarto form, about 25 pages in each. It is ably written, and fully illustrated by engravings that are well executed. One chapter in each number is devoted to American patents, and is written by one of our own citizens. It is the best work of this description that we are acquainted with. Price, $3 a year. Single numbers, 25 cents.

OUTLINES OF HISTORY, Illustrated by numerous Geographical and Historical Notes, Maps, etc. By MARCUS WILLSON. New-York: Ivison & Phinney, No. 178 Fulton street.

THIS excellent manual appears in two "editions;" the University and the School edition. The latter has been laid on our table. It includes both ancient and modern history, is abundantly full of matter, well arranged and well expressed, and is handsomely executed. Teachers and committees should examine it.

A CHILD'S HISTORY OF ENGLAND. By CHARLES DICKENS. Vol. 2. Harper & Brothers: 1854.

THE first volume of this little work was noticed some months since. The second volume has been laid on our table. It brings the narrative down to 1837. It is a valuable book.

HARPERS' GAZETTEER OF THE WORLD. Nos. I. and II.

THE first two of the ten numbers which are to compose this work are on our table. They are beautifully executed, large octavo size, and each is accompanied by an extensive map, to wit, of the World, and of Central and Southern Europe. They occupy 358 pages of letter-press. The smaller places, rivers, etc., are of course but little more than named, while the larger and more important ones are treated at length, and apparently with great care. It occupies ground covered by no recent publication, and will be required, as it richly deserves a place for its own merits, in every library.

NATIONAL MAGAZINE, ETC. ABEL STEPHENS, Editor.

THIS popular monthly, now in its fifth volume, is a capital work—well written, well illustrated, and well executed. Its last recent numbers rank among the very best in our country.

THE FARMER'S LAND-MEASURER, OR POCKET-COMPANION. By JAMES PEDDER, Editor of the *Boston Cultivator*. 144 pp. small 12mo. New-York: C. M. Saxton. 1854.

THIS book shows how to measure land, and contains numerous tables showing the requisite length or width for an acre, when one only of these lines is known; also the number of furrows, hills, etc., at given distances on a given area; and various measurements the farmer has occasion to make.

CHEMICAL FIELD-LECTURES FOR AGRICULTURISTS. By DR. JULIUS ADOLPHUS STÖCKHARDT. Translated from the German, and edited, with notes, by JAMES E. TESCHEMACHER. 242 pp. 12mo. New-York: C. M. Saxton.

THE name of Mr. Teschemacher is enough to give substantial indorsement to any book on agriculture. We should require no other. Nor does this sort of evidence fail us in this little work. It is a capital exhibition of the subject discussed, inferior to none we have seen. It tells the whole story which has been so often attempted, and with various success, in much larger volumes. It is very handsomely printed.

MINISTERING CHILDREN, a Tale dedicated to Children. By the author of "Sunday Afternoons in the Nursery," "The Light of Life," "The Female Visitor to the Poor," etc. 415 pp. 12mo. New-York: Riker, Thorne & Co. 1854.

THIS is an admirable work, full of interest to persons of all ages. In the moral and religious influence it is calculated to exert, it is not surpassed by any similar publication we have ever seen. While it is full of incident, it is everywhere true to nature. We heartily commend it to Sabbath-schools and for private families.

FASHION AND FAMINE. By MRS. ANN S. STEPHENS. New-York: Bunce & Brothers, 1854.

THIS volume, if not entirely new, is at least new in its present goodly features. Mrs. Stephens is well known as one of our most popular writers, and she deserves all the reputation she has earned. In giving this well-executed volume to the public, she has done it an essential favor, and deserves ample patronage. We hope she and her publishers will receive it. The story is remarkably entertaining, and, like the volume just mentioned, it has a most excellent moral

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List of Patents Issued,

FROM JUNE 6 TO JULY 4.

Dominique Emile Coutaret, of Roxbury, Mass., for improvement in the manufacture of sulphuric acid. Patented in England, Dec. 16, 1853.

Wm. R. Palmer, of Elizabeth City, N. C., for improvement in threshers.

Joseph Iler and Wm. Fitzpatrick, of Troy, for improvement in nail-plate feeders.

Tyler Howe, of Cambridgeport, Mass., for improvement in bed-bottoms.

David Prew, of Taunton, Mass., for improvement in cast-iron car-wheels.

Casimir Abos, of New-Brunswick, N. J., for improvement in spark-arresters.

John M. Bachelder, of Cambridge, Mass., for improvement in insulating telegraph wires.

Thomas Ashcroft, of Dorchester, Mass., for improvement in operating cut-off valves for steam-engines.

Samuel Childs, of New-York, for improvement in stills for distilling fatty bodies.

Silas Constant, of Brooklyn, for lens-lamp chimney.

Nathaniel Dodge, of Orford, N. H., for improvement in the construction of tanning apparatus.

Anthony Faas, of Philadelphia, for improvements in the construction of accordeons.

Eli H. Green, of Baltimore, Md., for improved carriage-axle.

Geo. P. Gordon, of New-York, for improvement in tail-boards.

F. M. Harris, of Carroll, Ohio, for improvement in all-boards of wagons.

R. M. Handley, of Lynchburg, Ohio, for improvement in bed-bottoms.

Bernard Hughes, of Rochester, N. Y., for improvement in vices.

Wm. E. Jones, of U. S. Army, for improvement in saddle-trees.

Joseph Keech and Stephen Stillwell, of Waterloo, for improvements in winnowing-machines.

William Montgomery, of Roxbury, Mass., for improvements in machine card-teeth.

J. Vaughan Merrick, of Philadelphia, for improvement in exhaust fans.

Andrew Overend, of Philadelphia, for improvement in printers' friskets.

Chas. A. Wilson, of Newport, Ky., for improvement in operating valves for steam-pumps.

Martin Newman, (2d,) and N. C. Whitcomb, of Lanesboro', Pa., and G. C. Cole, of Hartford, Conn., for improvement in coupling.

David L. Lafourette, of St. Louis, for improvement in mills.

Bronson Murray, of Farm-Ridge, Ill., assignor, (through T. Rush Spencer, of Geneva, N. Y.,) to John S. Wright, of Chicago, Ill., for improvement in harvester-cutters.

David N. Kownover, of Danville, Pa., assignor to Richard L. Kownover, of Milton, Pa., for improved mode of closing wickets in canal-gates.

Lyman Clark, of Royalston, Mass., assignor to Lyman Clark and Jos. Sawyer, for instrument for trimming welts of boots, shoes, etc.

Charles Perley, of New-York, for improvement in adjustable rails for replacing cars on the track.

Charles Perley, of New-York, for improvement in chain-cable stoppers.

Samuel Perkes, of London, England, for improvements in crushing and grinding quartz and minerals. Patented in England, Oct. 12, 1852.

Merritt F. Potter, of Charlemont, Mass., for improvement in railroad odometers.

Ebenezer N. Price, of Salem, Mass., for improvement in bridle-bits.

Isaac Starks, of Genoa, N. Y., and Lyman Perrigo, of Croton, N. Y., for improved device for holding pieces in spoke-machines.

James L. Rowley, of Steuben county, Indiana, for improvement in carriages.

Ira Reynolds, of Republic, Ohio, for improvement in harvesters.

Charles Schinz, of Camden, N. J., for improvement in processes for hardening tallow.

John Stowell, of Charlestown, Mass., for improved steering apparatus.

Peter Sweeney, of Buffalo, for improvement in steam-boilers.

Wm. Shove, of Elizabethport, N. J., for improvement in buckles.

E. H. Sprague, of Zanesville, for improvement in locking up printers' forms.

Thos. Silver, of Philadelphia, for improvement in tightening windows.

David J. Slagg, of Hoboken, for improvement in operating bolts and locks for controlling series of doors.

G. B. Simonds, of New-Haven, Conn., and Abel Brewer, of Saugatuck, Conn., for improvement in spark-arresters.

Henry C. Sergeant, of Cincinnati, for improvement in feed-water apparatus to steam-boilers.

Thomas, Earl of Dundonald, of London, Eng., for improvement in compositions for coating telegraphic wires, and for other purposes. Patented in England, Oct. 6, 1852.

J. C. Taylor, of Camden, N. J., for improvement in soap-compounds. Patented in England, Sept. 17, 1853.

J. C. Taylor, of Camden, N. J., for improvement in soap-manufacturing processes. Patented in England, Sept. 17, 1853.

Anthony Vitally and Carl Kold, of Newark, N. J., for improvement in securing tools to their handles.

Geo. Yates and Eli Clayton, of Lancaster, Pa., for improvement in looms.

John Reyan, of Jersey City, for railroad car-ventilator.

James Wightman, of Pittsburg, for improvement in steam-boilers.

Geo. W. Wood and Lucius G. Webster, of Utica, for improved canal-lock gates.

Geo. Westinghouse, of Central-Bridge, N. Y., for endless chain horse-power.

James Weight, of Lawrence, Mass., for improvement in machinery for napping cloth.

Edmond Victory, of Watertown, N. J., assignor to D. M. Linsley and Geo. Goulding, of same place, for improvement in machinery for spinning wool.

Edwin Allen, of South-Windham, Conn., for improved veneer-polisher.

John Allender, of New-London, for improvements in metallic grommets.

D. C. Ambler, of New-York, for improvement in quartz-crushers.

D. C. Ambler, of New-York, for improvement in the setting of steam-boilers.

Gabriel Blondin, of New-York, for improvement in processes for treating paint.

Gabriel Blondin, of New-York, for improvement in paint-compositions.

Frederick M. Bartholomew, of New-York, for method of governing the action of valve-cocks.

Thos. H. Barlow, of Lexington, Ky., for improvements in cut-nail machines.

Mark S. Bassett, of Wilmington, Del., for flour-sifter and renovator.

Jos. Bone, of Warrenton, Ohio, for improvement in grain-winnowers.

Benj. Crawford, of Pittsburg, for improvement on high-pressure steam-engines.

Thos. Crossley, of Boston, for improved machine for printing woollen and other goods. Patented in England, April 5, 1854.

B. Franklin Day, of Philadelphia, for improvement in steam-engines.

Samuel Fay, of Lowell, for improvement in weaving double cloth.

F. A. Gleason, of Rome, for improvement in the construction of reed musical instruments.

Geo. W. Griswold, of Carbondale, for improved tool-handle.

Charles J. Harris, of Holyoke, Mass., for improvement in producing continuous circular from reciprocating rectilinear motion.

John Henry, of Lynchburg, Va., for improvement in cast-iron car-wheels.

Frederica Howes, of Yarmouth, Mass, for extra yard to topsail.

Solm. T. Huntington, of Syracuse, for improvement in carriage-tops.

Nathan Johnson, of Noblesville, Ind., for improvement in the mode of moulding bricks.

Chas. C. Lloyd, of West-Philadelphia, Pa., for improvement in gas-metres and regulators.

John S. Martin, of Boston, for improvement in painters' brushes.

Thomas G. McLaughlin, of Philadelphia, for improvement in radial arms for car-brakes.

Duncan E. McDougall, of Springfield, Mass., for improved burglars' alarm.

Anson Merriman, of Middletown, Conn., for improvement in steam-engine regulators.

Nathan F. Matthewson, of Providence, R. I., for improved watch-chain swivel.

Edmund Morris, of Burlington, N. J., for improved slate-frame.

Orwell H. Needham, of New-York, for improvement in breast-pump.

James F. Osborn, of Staunton, N. J., for improved method of turning casks, etc., from solid pieces.

Charles Parker, of Meriden, Conn., for improvement in cast-iron vices.

Benj. F. Reimer, of Philadelphia, for improvement in railroad car-brakes.

Jesse Reed, of Marshfield, Mass., for improved arrangement of ship's capstan and windlass.

S. Brockway Robinson, of Oswego, for machine for drying grain.

Warren Shaw and Perley G. Green, of Wales, for improvement in tentering cloth.

Adrian R. Terry, of Detroit, for improvement in coating gas-retorts.

Chas. E. John and Samuel Wethered, of Baltimore, for application of ordinary and super-heated steam, combined for heating purposes.

Joseph B. Winchester, of Medina, N. Y., for improved mode of raising and letting fall carriage-tops.

Wm. C. Wright, of Boston, for improvement in folding and measuring cloth.

Seneca V. Collins, of Charlestown, Mass., assignor to William O. Hickok, of Harrisburgh, Pa., for mode of setting and holding pens for paper-ruling.

Luther Hill, of Stoneham, Mass., assignor to himself and Lorenzo Stratton, of Feltonville, Mass., for improvement in machines for cutting out boot-soles.

Levi W. Mallory, of Philadelphia, assignor to Wm. Morris, of same place, for improvement in omnibus registers.

Stephen White, of Newark, assignor to Henry C. Jones, of same place, for improvement in padlocks.

Jonathan Amory and William P. Parrot, of Boston, for improvement in the furnace of steam-boilers.

Jesse Rauman, of Shepherdstown, Pa., for improvement in cider-mills.

Chas. H. Beatty, of Wheeling, for improvement in coffee-mills.

S. Oscar Cross, of Kingsbury, N. Y., for improved grape-frame.

Thos. H. Dodge, of Nashua, N. H., for improvement in gas and liquid regulators.

[illegible] o. Esterly, of Heart-Prairie, Wis., for improvement in grass-harvesters.

Joe A. H. Ellis and Alex. Gordon, of Rochester, for improvement in reversible capstans.

J. Durell Green, of Cambridge, for improvement in breech-loading fire-arms. Patented in England, May 12, 1854.

Wm. Hall, of Boston, for improvement in bank-locks.

Daniel Hill, of Bartonia, Ind., for improved seed-planter.

Julius Hotchkiss, of Waterbury, Conn., for improvement in manufacturing suspender-ends.

Walter Hunt, of New-York, for improvement in sewing-machines.

H. M. Johnson, of Carlisle, Pa., for improved rotary cultivator.

D. W. Kennedy, of Staunton, Va., for improvement in drying cloth.

Geo. W. La Baw, of Jersey City, for improved mitre-machine.

Alex. B. Latta, of Cincinnati, for improved hydro-pneumatic force-pump.

John McF. Lyeth, of Baltimore, for improvement in coffins.

Wm. Mallerd, of Brooklyn, for improved regulator of gas-burners.

Wm. Mallerd, of Brooklyn, for improvement in gas-burners.

John H. McGowan, Jr., of Cincinnati, for improved double-acting force-pump.

John Melendy, of Southbridge, Mass., for improved fruit-picker.

Daniel Minthorn, of New-York, for improvement in inhaling-tube.

Wm. J. Miller, of Cold Spring, for improvement in machines for cutting brads.

Thomas Penrose, of Ellington, Ill., for improved road-scraper and spreader.

T. H. Peavey, of South-Montville, Me., for improved charger for fire-arms.

Oliver Pier, of Harmony, N.Y., for improved trap for animals.

L. L. & A. L. Platt, of Newtown, Conn., for improvement in the manufacture of wooden buttons.

Hiram and Simon H. Plumb, of Honesdale, for improved mortising-machine.

B. D. Sanders, of Holliday's Cove, Va., for improvement in winnowers of grain.

Wm. H. Sanders, of Hastings, N.Y., for improved carriage-axle.

Pearly Seaver, of Oxford, for improved calipers.

Isaac Strub, of Cincinnati, for improvement in grinding-mills.

Thos. Sumner, of Paterson, for improvement in steam-hammers.

Hartwell L. Turner, of Strykersville, N. Y. for improved head-gate for water-wheels

Enoch Thorn, of Philadelphia, for improvement in ventilating sewers.

Philo Washburn, H. G. O. White, and George A. Copeland, of Taunton, Mass., for improvement in coffins.

Henry Weed, of Philadelphia, for improved mode of constructing wire bonnet-frames.

Wm. E. Woodbridge, of Perth-Amboy, assignor to Charles Humphrey, of same place, for improvement in whistling-tops.

Wm. F. Collier, of Worcester, Mass., assignor to himself and Joseph Boyden, of same place, for improved machine for feeding paper to printing-presses.

Milton D. and Lyman W. Whipple, of Somerville, Mass., assignors to Lyman W. Whipple and Robert B. Fitts, of same place, for process of engraving or printing upon glass.

F. C. Goffin, of New-York, assignor to Alfred B. Ely, of Boston, for powder-channel to doors of safes and bank-vaults.

David Brown, of Baltimore, assignor to John F. Clark, of Washington, D. C., and David Brown, aforesaid, for improvement in machines for moulding for metal castings.

Ira Carter, of Champlain, for improved pump.

Aug. F. Dalson, of New-York, for improvement in milk and other evaporators.

James Eberhardt, of Philadelphia, for improvement in the preparation of archil.

Henry B. James, of Trenton, N. J., for improvement in smut-machine.

Alfred D. Kelley, of Rochester, N. H., for improvement in heel-cutters. Ante-dated March 20, 1854.

Edward Lindner, of New-York, for improved magazine repeating and needle-gun.

Abner N. Newton, of Richmond, Ind., for improvement in breech and loading fire-arms.

James Noble, of Leeds, England, for improvement in combining cotton and other fibrous materials.

Thomas Pearsally, of Smithboro', N. Y., for ventilated flour-barrel.

Jacob Bevercomb, of Potetourt Springs, Va., for improvement in ploughs.

Philos B. Tyler, of Springfield, Mass., for improvement in cordage machinery.

Abraham Gesler, of Williamsburg, assignor to the "Asphalte Mining and Kerosene Gas Company," of New-York, for improvement in Kerosene burning fluids.

Galusha J. Bundy, of Lyndon, Vt., for improvement in potato-diggers.

Henry G. Bulkley, of Kalamazoo, for improvement in the construction of salt evaporators.

Aury G. Coes, of Worcester, for improvement in screw-wrenches.

Thos. Cox, of Lancaster, Pa., for improved machine for bending felloes.

A. S. T. Copeland, of Pittsburg, for improved mechanism for operating saw-mill carriages.

Archibald H. Crosier, of Oswego, for improved machine for creasing and leveling barrels.

Thos. W. Currier, of Lawrence, Mass., for improvement in sofas, crib-bedsteads, etc.

James A. Cutting, of Boston, for improvement in preparation of collodion for photographic pictures.

Dexter Dennis, of Barre, Mass., for improvement in finishing palm-leaf hats. Ante-dated January 4, 1854.

C. H. Eisenbrandt, of Baltimore, for improved valve for wind musical instruments.

William Finkle, of Cole-Creek, Ind., for millstone dress.

Robt. H. Forbes, of Boston, for improvement in lightning-rods for vessels.

Joseph Frey and D. B. Burnham, of Battle-Creek, Mich., for submarine battery.

Heman Gardiner, of New-York, for improvement in quartz-crushers.

Thos. Green, of Philadelphia, for improvement in steam-boilers.

Joel Gleason, of Geneva, for improvement in milk-strainers.

John R. Hague, of Pittsburg, for improvement in machinery for punching rivet-holes in hose.

Wm. C. Hibbard, of Boston, for improvement for regulating the motion of steam-boilers.

Enoch Hiddon, of New-York, for improvement in reading and writing-stands.

Fenton Humphrey, of Boontan, N.J., for improvement in spike-machines.

Samuel Ide, of East-Shelby, N. Y., for improvement in seed-planters.

Joshua K. Ingalls, of Williamsburg, N.Y., for improved catch for vault-covers.

Philip H. Keck, of Morgantown, Va., for improvement in wash-boards.

Jos. F. Laird, of Philadelphia, for improvement in ore-stamping machines.

Jos. Leeds, of Philadelphia, for improvement in controlling draught in brick and lime-kilns.

Wm. Henry Muntz, of Norton, Mass., for improvement in paddle-wheels.

John A. Pitts, of Buffalo, for improvement in horse-powers.

Ben. Severson, of Philadelphia, for improvement in cast-iron car-wheels.

John S. Speights, of Baltimore, for improvement in brick-kilns.

M. J. Wheeler, G. W. Rogers, H. W. Pierce, and M. B. Tidey, of Dundee, N. Y., for improved leveling-plane.

Jerome B. Young, of Harper's Ferry, for improved mode in hanging bells.

Wm. H. Poindexter, of Fayette county, Tenn., administrator *de bonis non* of John R. Remington, deceased, late of Macon county, Ala., for improvement in cement compounds.

Henry Burt, of Newark, N. J., assignor to the Newark Patent Hosiery Company, of the same place, for improvement in knitting-machines.

Thomas Drayton, of Brooklyn, assignor to G. W. McCready, Jr., of New-York, for improvement in purifying oils.

Wm. Butterfield, of Boston, assignor to himself and Edgar M. Stevens, of same place, for improvement in sewing-machines.

Sol. W. Ruggles, of Fitchburg, Mass., assignor to himself, Artemas R. Smith, and Joseph O. Austin, of same place, for improvement in self-acting cheese-presses.

John Taggart, of Roxbury, assignor to himself and Richard Pitts, of Dorchester, Mass., for improved machine for excavating earth.